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THE CATHOLIC UNIVERSITY OF AMERICA

ANNOUNCEMENTS

OF

THE SCHOOL OF SCIENCES

1911-1912

WASHINGTON
Published by the University
1911

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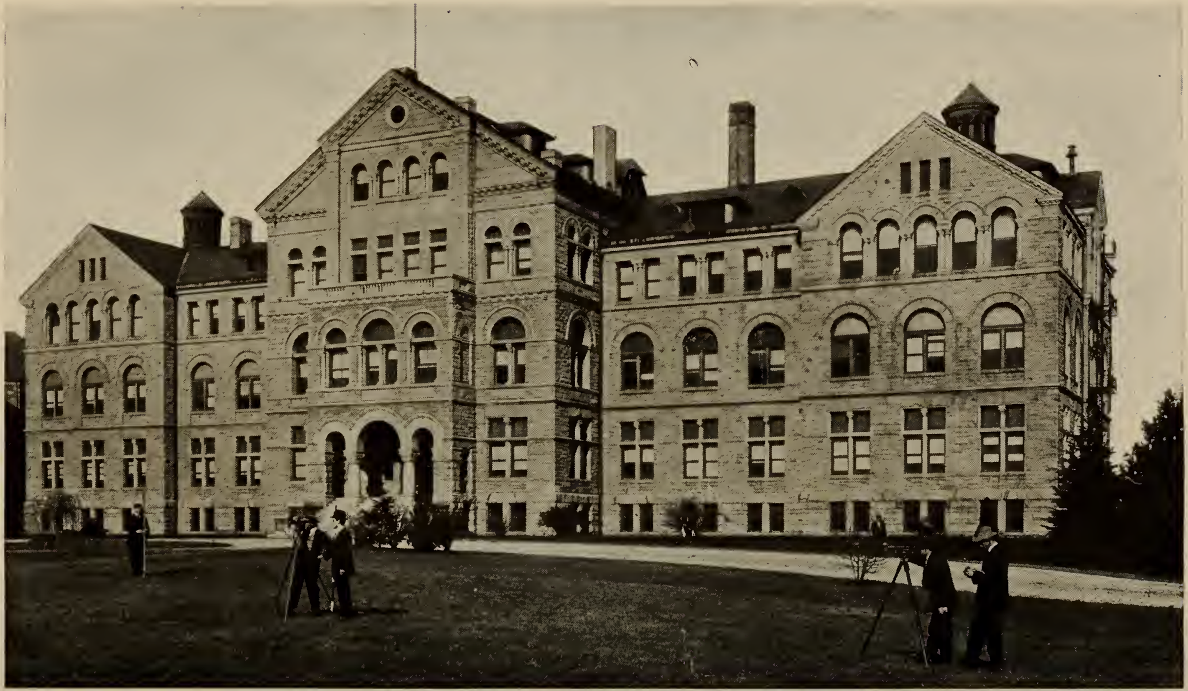

McMahon Hall

THE CATHOLIC UNIVERSITY OF AMERICA

ANNOUNCEMENTS

OF

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WASHINGTON
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National Capital Press, Inc.
Book Manufacturers
Washington, D. C.

THE SCHOOL OF SCIENCES

THE FACULTY

His Eminence, James Cardinal Gibbons, *Chancellor of the University.*

Right Rev. Thomas Joseph Shahan, S.T.D., J.U.L., *Rector of the University.*

Very Rev. John Joseph Griffin, Ph.D., *Vice Dean; Patrick B. O'Brien Professor of Chemistry.*

Daniel William Shea, Ph.D., *Dean; John O'Brien Professor of Physics.*

Aubrey Edward Landry, Ph.D., *Secretary; Associate Professor of Mathematics.*

Alfred Doolittle, A.B., *Instructor in Mathematics and Astronomy.*

George Francis Harbin, A.B., E.E., Diploma from the Westinghouse Electric and Manufacturing Company's Engineering Course, *Instructor in Electrical Engineering.*

Louis Henry Crook, B.S., *Instructor in Mechanics and Physics.*

George Alphonsus Weschler, B.S. in Mechanical Engineering, *Instructor in Mechanical Engineering.*

Frederick Vernon Murphy, Graduate of the École des Beaux Arts, Paris, *Instructor in Architecture.*

Fred Knights Merriman, S.B., *Instructor in Civil Engineering.*

John Bernard Parker, A.M., *Instructor in Biology.*

Charles Lawler Kelly, A.B., *Instructor in Chemistry.*

James Francis Connor, A.B., *Instructor in Mathematics.*

John James Cantwell, *Instructor in Drawing.*

Clarence Edward Baltzley, *Assistant in Metallurgy and Assaying.*

John Joseph Widmayer, Jr., B.S., *Assistant in Physics.*

William Edward Hatcher, *Custodian of Apparatus, Chemical Laboratory.*

GENERAL STATEMENT

HISTORY OF THE SCHOOL AND THE FACULTY OF SCIENCES

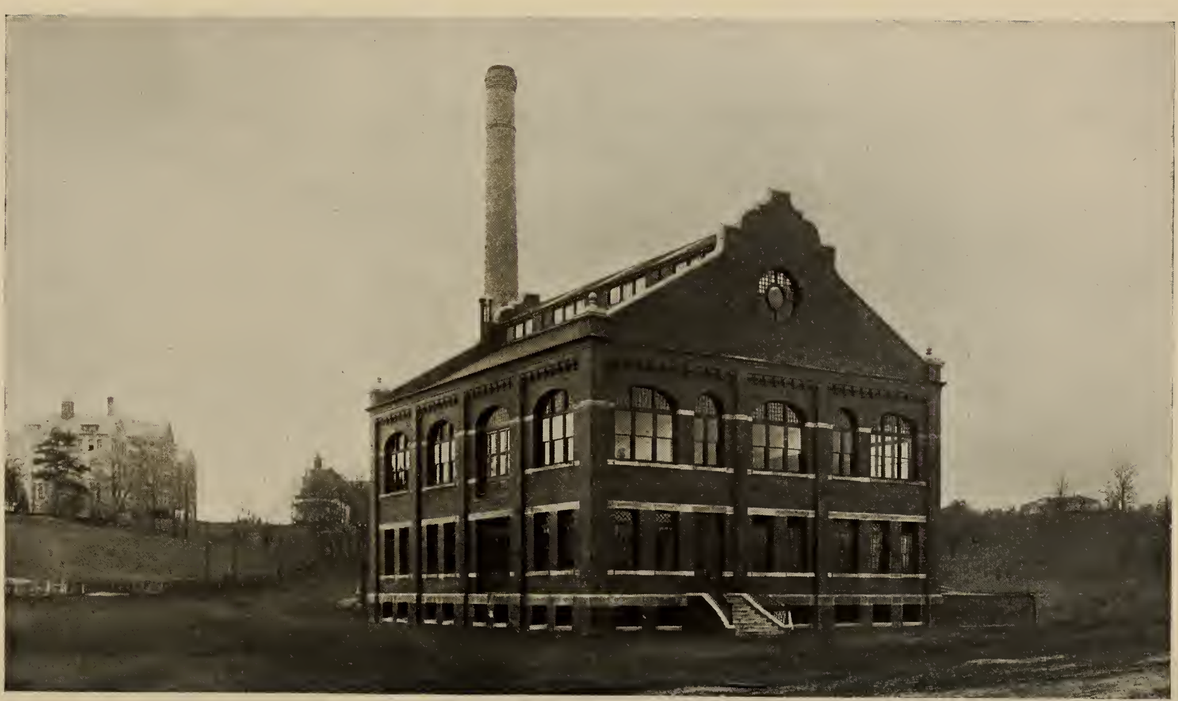
In April, 1906, the Board of Trustees grouped under the title "School of Sciences" several of the departments of pure and applied science which had existed under the Faculty of Philosophy since its inception in 1895, and created the "Faculty of Sciences," with the professors of the above referred to departments as its members. To this new Faculty is entrusted the training of young men for careers in sciences, engineering and the mechanical arts.

Some changes in departments have been made since 1906. The present list of departments in the School of Sciences is as follows:

The Department of Mathematics
The Department of Chemistry
The Department of Physics
The Department of Mechanics
The Department of Astronomy
The Department of Biology
The Department of Botany
The Department of Drawing
The Department of Architecture
The Department of Civil Engineering
The Department of Electrical Engineering
The Department of Mechanical Engineering

NEED OF SCIENTISTS AND ENGINEERS

A point has been reached in American industrial development where scientific method and scientifically trained men are needed as never before. From now on, industrial and commercial progress must depend more and more upon refinement in practice. In the attainment of such refinement, the knowledge and training which students have opportunity of obtaining in our



Engineering Building

libraries, lecture-rooms and laboratories, are fundamental and essential factors.

The varied knowledge required in the management of the industries of the country requires the scientist and engineer to be more or less specialists in one or more branches of the profession. Thus there are chemists, physicists; civil, electrical, mechanical, chemical engineers, etc. But the fields covered by the various branches overlap one another in so many different directions that it is impossible to determine sharply their boundaries.

There are already numerous opportunities afforded to young men of scientific or engineering training along the well known and clearly defined lines of technological activity. New fields are continually appearing, and the probabilities are that the supply of good men will not equal the technological demands for a long time to come.

LOCATION OF THE SCHOOL OF SCIENCES

Washington is admirably suited to be the seat of the School of Sciences of the Catholic University of America, for the City is in the van of progress in regard to the modern applications of science to human needs, having within its limits, or in its environs, numerous government libraries, museums, laboratories, and factories, which are accessible to investigators and students, under the terms of the following joint resolution of Congress, approved April 12, 1892:

"*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the facilities for research and illustration in the following and any other governmental collections now existing or hereafter to be established in the city of Washington for the promotion of knowledge shall be accessible, under such rules and restrictions as the officers in charge of each collection may prescribe, subject to such authority as is now or may hereafter be permitted by law, to the scientific investigators and to students of any institution of higher education now incorporated or hereafter to be incorporated under the laws of Congress or of the District of Columbia, to wit:

1. Of the Library of Congress.
2. Of the National Museum.
3. Of the Patent Office.
4. Of the Bureau of Education.
5. Of the Bureau of Ethnology.
6. Of the Army Medical Museum.
7. Of the Department of Agriculture.
8. Of the Fish Commission.
9. Of the Botanic Gardens.
10. Of the Coast and Geodetic Survey.
11. Of the Geological Survey.
12. Of the Naval Observatory."

Additional bureaus and laboratories are: The Weather Bureau with its extensive equipment for the study of meteorology; the Bureau of Standards which standardizes all measuring instruments, and makes exhaustive investigations in all physical and chemical problems relating to the production of standards; the Laboratory for the Marine Hospital and Public Health Service for the study of Bacteriology, Pathology, and Biochemistry. Besides the government institutions there are in Washington the great Carnegie Institution and the Carnegie Geophysical Laboratory. The steel and other factories of Baltimore, and the shipbuilding plants at Baltimore and Newport News, offer opportunities for tours of inspection.

The climate of Washington is excellent. Its beauty of situation, and its pleasant and healthful surroundings are widely known.

The University buildings in which the departments of science find location are picturesquely situated on the highlands near the northern limits of Washington, about three miles from the magnificent group of buildings on Capitol Hill. Most of the departments have commodious quarters in the McMahon Hall of Philosophy, Letters and Sciences. The Departments of Electrical and Mechanical Engineering occupy a large building, constructed in 1910-11, especially for these two departments, and for the central heating, lighting and power station of the University. The grounds consist of about eighty-five acres, laid out with care and ornamented with trees and shrubs. There are several tennis courts and a field for base-ball, foot-ball and other out-door sports. There is also a small, temporary building fitted for indoor sports and general gymnasium exercises.

The Brookland cars of the Washington Railway and Electric Company pass the entrances to the grounds, at intervals of a few minutes.

METHOD IN THE SCHOOL OF SCIENCES

The system of instruction aims to equip the student with the scientific principles underlying his chosen field, and at the same time to train the reasoning faculties and to develop the power of applying abstract theory to practical operations so that he may be able to utilize in industrial fields the knowledge acquired in this school. Effort is made to awaken and stimulate initiative in students, to develop their individual capacity, and to lead them to use their energy effectively. Emphasis is laid upon the necessity of forming habits, character and associations which will make initiative, capacity and energy of permanent productive value.

The effort is made to ground the student so well in the principles of science and engineering that he will feel himself competent to attack intelligently any problem that may arise in his practice. It is characteristic of the scientific and engineering professions that the scientist and engineer never know what they may be called upon to do. New conditions suddenly arise, accidents occur. The scientist or engineer must decide quickly and accurately what is best to be done in an emergency, and then do it promptly and surely.

DEPARTMENTS OF INSTRUCTION

THE DEPARTMENT OF MATHEMATICS

This Department has been established in order to enable the student to complete the studies in Mathematics which he commenced in the College or Academy, and especially to prepare himself for his intended work in other Departments of the School of Sciences. For admission to its elementary courses a thorough knowledge of Algebra through quadratics, and of Plane Geometry, is required. The qualifications necessary for entrance to its advanced courses are stated in connection with the courses as hereinafter announced. Instruction in Algebra and Plane and Solid Geometry will be provided should there be a sufficient demand.

I. ADVANCED ALGEBRA. — Logarithms, series, elementary theory of equations. Lectures and problems: *Section A, M., W., Th., F., S.*, 9-10, *first half-year; Section B, M., Tu., Th., F.*, 12-1, *and S.*, 10-11, *first half-year.*—MR. DOOLITTLE and MR. CONNOR.

II. TRIGONOMETRY.—Plane Trigonometry and the Elements of Spherical Trigonometry. Lectures and problems: *Section A, M., W., Th., F., S.*, 9-10, *first half-year; Section B, M., Tu., Th., F.*, 12-1, *and S.*, 10-11, *first half-year.*—MR. DOOLITTLE and MR. CONNOR.

III. ANALYTIC GEOMETRY.—Plane Analytic Geometry and the Elements of Solid Analytic Geometry. (Math. II required.) Lectures and problems: *Section A, M., W., Th., F., S.*, 9-10, *second half-year; Section B, M., Tu., Th., F.*, 12-1, *and S.*, 10-11, *second half-year.*—MR. DOOLITTLE and MR. CONNOR.

IV. CALCULUS.—Differential and Integral Calculus, elementary course. (Math. III required.) Lectures, *Tu., Th., S.*, 10-11; problems, *M.*, 12-1, *and W.*, 3-4, *first half-year, M.*, 12-1, *and W.*, 8-9, *second half-year.*—DR. LANDRY.

V. CALCULUS.—Differential and Integral Calculus, advanced course. (Math. IV required.) Lectures and problems, *M., W., F.*, 11-12, *and S.*, 9-10, *first half-year.*—DR. LANDRY.

General Chemistry

VI. Differential Equations.—(Math. V required.) Lectures and problems, 3 *hrs. a week, second half-year.*—Dr. Landry.

VII. Elementary Theory of Functions.—(Math. V required.) Lectures and problems, 3 *hrs. a week.*—Dr. Landry.

THE DEPARTMENT OF CHEMISTRY

The courses in Chemistry are organized with the general aim of exciting in the student a spirit of inquiry and of training him to the habit of persistent work, and of dealing intelligently and correctly with nature and its laws. In Chemistry, as in all other experimental sciences, progress consists in the discovery and classification of facts. Hence the student must be made acquainted with the methods of observation, and experimental facts, and the laws of Chemistry. From the very beginning of his course the greatest stress will be laid upon laboratory work; but lectures will be regularly given in General, Organic, Theoretical, and Physical Chemistry, and, from time to time, on selected topics.

Though the courses are primarily intended for those looking forward to a career as scientists or teachers, the instruction and training imparted in them is of equal importance and utility to the analyst, the practical and the technical chemist.

A liberal allowance of material and apparatus is permitted to each student, and excellent facilities for the production of special apparatus are at his disposal.

The courses of instruction offered in this Department commence with the rudiments of the science in order that the student may be properly prepared, both in knowledge and method of study, for profitable work in the more advanced courses.

Laboratory Fees.—The fee for those whose courses call for six hours of laboratory work per week is $20.00; for those who spend a greater time in the laboratory, $30.00. Laboratory fees are payable in advance. Ordinary chemicals are not charged for. Costly chemicals, and all apparatus in charge of the student, must be receipted for by him. The receipts are held by the custodian of apparatus till the time of settlement of accounts, when all apparatus not returned must be paid for.

I. GENERAL CHEMISTRY.—This course is designed to illustrate the general laws and doctrines of Chemistry, leading the student, by observation of the fundamental facts of the science, to grasp the connection between these facts and the underlying principles. Prominence is also given to those principles of Physics which find application in chemical operations. The laboratory work in connection with this course includes the preparation from ores and other crude materials of a number of chemical compounds; the detailed study of these; practical proofs of chemical laws, and a thorough drilling in qualitative analysis. Lectures, *M., W., F.,* 10-11; laboratory, *M., Th.,* 2-5.—DR. GRIFFIN and assistants.

II. ORGANIC CHEMISTRY.—In this course the student is introduced to the study of compounds of carbon. The points of similarity and difference between organic and inorganic Chemistry are touched upon, then the most important members of the paraffin and aromatic series are studied in detail, and the development of this branch of Chemistry and its bearing upon chemical theory are considered.

In the laboratories the student is given practice in quantitative analysis, both inorganic and organic, more or less extensive according to the needs of his future work. He studies the method of purification of organic compounds, the preparation and identification of typical substances, and such others as will familiarize him with the various methods of reduction, oxidation, nitrification, sulphonation, etc., on which the great chemical industries are based. Lectures, *M., F.,* 9-10; laboratory, *M., Th.,* 2-5.—DR. GRIFFIN and MR. KELLY.

III. QUANTITATIVE ANALYSIS.—This course comprises practical instruction in the most important methods of analysis, gravimetric, volumetric, electrolytic and organic. Laboratory, 8 *hrs. a week.*—MR. KELLY.

Organic Chemistry

IV. Physical Chemistry.—Measurements of mass and volume, specific gravity, determinations of matter in its various states, the phase law and mass reactions, thermo-chemistry and calorimetry, osmotic pressure and the theory of solutions, theory and use of the spectroscope, polariscope and refractometer. Laboratory, 6 *hrs. a week, second half-year.*—Mr. Kelly.

V. Electro-Chemical Analysis.—Theory of the voltaic cell, electro-chemical oxidation and reduction, deposition of metals, determination of conductivity of solutions. Lectures and laboratory, 6 *hrs. a week, first half-year.*—Dr. Griffin.

VI. Water and Gas Analysis.—Examination of air, furnace and illuminating gas. Laboratory, 6 *hrs. a week, second half-year.* —Mr. Kelly.

VII. Industrial Chemistry.—The preparation of chemical products from raw materials. Methods of purification and testing. Economic factors in production, and the utilization of waste products. Laboratory, 6 *hrs. a week.*—Dr. Griffin.

VIII. Metallurgy.—Wet and fire assays of ores, and testing of the refined products. Lectures, *W.*, 12-1; laboratory, *W.*, 2-5.30, *first half-year, W.*, 10-12, *and* 2-4, *second half-year.*—Mr. Baltzley.

IX. Advanced Work.—This course will consist of a detailed study of some of the classical pieces of work which have been of epoch-making influence or of great theoretical importance. In addition the formation of the reading habit, so essential to the success of the working chemist, will be encouraged, and for the furtherance of this object the student will be required to summarize from the original papers the important phases of chemical development. The chemical library is very well equipped for this work. It is rich in complete series of the most important periodicals and in all the current periodical literature of the science. The student will find a reading knowledge of French and German necessary at this stage of his work.

In the laboratory the student will undertake the preparation of the more difficult chemical compounds and the study of complex reactions; after which the research work, upon the result of which his thesis for the doctorate is based, will be undertaken. From time to time during the period of advanced work, short lecture courses, supplemented by laboratory work, will be given in physical and electro-chemistry, toxicology, industrial, and pharmaceutical chemistry.—Dr. Griffin.

THE CHEMICAL LABORATORY, LIBRARY AND MUSEUM

Ample facilities are provided for extensive laboratory work in any of the courses. The Chemical Museum affords opportunity for the study of ores and metals and the crude and refined products of chemical industry.

Arrangements have been made for the temporary accommodation of the Chemical Department in the east wing of McMahon Hall. On the third floor are situated the laboratories.

The laboratory of General Chemistry occupies the northeast corner of this story. Its floor dimensions are 40 x 30 feet. The height ranges from 17 feet at the sides to 30 feet in the center. The room is well lighted from windows on two sides, and it provides ample accommodations for thirty-six students. The Analytical laboratory is of the same dimensions as the laboratory of General Chemistry, and is fitted up for twenty-four students. The working tables are supplied with water, gas, suction, and electricity. The blast burners, in this and in the other laboratories, are supplied with air under pressure by an air pump in the basement. The Organic laboratory is 40 x 25 feet. Especial care has been taken in fitting up this laboratory to provide the advanced worker with all the most recent time-saving devices and conveniences. Each table is provided with taps for gas, water, steam and suction. Within easy access of every working place there is a large sink. The hood-room is ample, being equal to the table-room. At the end of the corridor is the balance-room, the balances being on slate shelves, bracketed to the masonry walls of the building.

No efforts have been spared in making the library of the Department so complete that the research student can have easy access to all there is of standard chemical literature. Historical Chemistry is represented by the works of Kopp, Berthelot, Meyer,

Metallurgy and Assaying

etc., and by many of the original papers of the eighteenth century chemists. The principal dictionaries: Beilstein, Ladenburg, Watt, and Thorpe, represented by the latest editions, and the larger treatises of Ostwald, Meyer and Jacobson, Dammer, Meyer, Roscoe and Schorlemmer, together with many lesser works, furnish the student with the latest ideas in theory and practice. A collection of 4,000 dissertations and monographs, with a card catalogue of the same, adds greatly to the efficiency of the library. The library is especially rich in periodical literature, possessing complete sets of the following journals: Annales de Chimie et de Physique, Journal für Praktische Chemie, Annalen der Chemie (Liebig), Journal of the Chemical Society (London), Bulletin de la Société Chimique de Paris, Berichte der Deutschen Chemischen Gesellschaft, Zeitschrift für Analytische Chemie, Zeitschrift für Anorganische Chemie, The Chemical News (London), Elektrochemische Zeitschrift, Zeitschrift für Elektrochemie, Chemisches Central Blatt, Monatshefte für Chemie, The American Chemical Journal, Zeitschrift für Physikalische Chemie, Recueil des Travaux Chimiques des Pays-Bas, Hoppe-Seyler's Zeitschrift für Physiologische Chemie, The Journal of the American Chemical Society, The Journal of Physical Chemistry, Moniteur Scientifique Quesneville, Zeitschrift für Angewandte Chemie, Jahresberichte über die Fortschritte der Chemie, Gazetta Chimica Italiana, Revue Générale de Chimie Pure et Appliquée.

The lecture-room is on the fourth floor of the central portion of the building. On this floor also are the Chemical Museum, the apparatus-office, rooms for photographic work, and the distilled-water apparatus.

The Chemical Museum contains collections which serve to illustrate inorganic and organic chemistry. In it are found, in well arranged cases, the various ores from which the metals are obtained, and the latter in various stages of refinement; typical compounds prepared by students working in the laboratories; and a very large collection of samples of the crude and refined products of chemical industry received from manufacturing chemists in all parts of the United States and Europe.

THE DEPARTMENT OF PHYSICS

This Department furnishes opportunity for instruction and research in the various branches of Physics. Its purpose is twofold: (1) To give students of any other Department of the University such an acquaintance with the principles and facts of Physics and with the methods of exact physical measurements, as may be deemed requisite for the intelligent pursuit of their chief work; (2) To give students of this Department a comprehensive and exact knowledge of experimental and mathematical Physics and a training in the methods of research that will fit them to pursue original work.

Instruction is given by means of lectures, laboratory practice, seminars, and such other academic devices as may be deemed necessary. Every incentive and facility possible is offered for original work of the highest character. The Physical Laboratory provides good opportunity for regular laboratory work and original research.

The Government museums and institutions afford advantages for students in this Department. The library of the Department is supplied with the standard works of reference and with the principal periodicals concerning Physics.

There is a laboratory fee of $10.00 for each of the courses I, II, IV, and VI.

I. GENERAL THEORETICAL AND EXPERIMENTAL PHYSICS.—Mechanics, Sound, Light, Heat, Electricity and Magnetism. Lectures with demonstrations. Measurements of the principal physical quantities, in the laboratory. (Math. II required.) Lectures, *M., W., F.*, 11-12; laboratory: *Section A, Tu.*, 2-5; *Section B, Th.*, 2-5; *Section C, S.*, 9-1.—DR. SHEA, MR. CROOK and MR. WIDMAYER.

II. ADVANCED THEORETICAL AND EXPERIMENTAL PHYSICS.—Mechanics, Sound, Light, Heat, Electricity and Magnetism. (Math. IV and Physics I required.) Lecture, *Tu.*, 11-12; laboratory, *M., W.*, 2-5.—DR. SHEA and MR. CROOK.

III. MATHEMATICAL PHYSICS.—(Math. VI and Physics II required.) Lectures, *M., W., F.*, 12-1.—DR. SHEA.

IV. RESEARCH.—(Physics II or its equivalent required.)

General Physics

The laboratory for research is always open to advanced students, and their work is under constant supervision. *M., T., W., Th., F.*, 9-5.—DR. SHEA.

V. PHYSICAL SEMINAR.—(Parts of Physics II and III and other qualifications to be determined for each applicant, required.) *F.*, 2-3.—DR. SHEA.

VI. MAGNETISM AND ELECTRICITY.—Parts of Magnetism, Electromagnetism, Electrodynamics, Electrostatics and Electrokinetics. Lectures. Measurements in the laboratory of magnetic and electrical quantities. (Physics I and Math. IV required.) Lecture, *Th.*, 11-12; laboratory, *W.*, 2-5.—DR. SHEA and MR. CROOK.

The Physical Laboratory occupies several rooms on the first floor and in the basement of McMahon Hall, all pleasantly located and supplied with gas, water, steam, electricity, blast and vacuum connections, and other conveniences for rapid and satisfactory work. The equipment, which is already considerable, represents the best productions of the leading instrument makers of the world. Additions are being made as rapidly as needed. A large workshop supplied with electric power, machines and tools, gives excellent opportunity for the quick manufacture of special pieces of apparatus.

THE DEPARTMENT OF MECHANICS

The work of this Department embraces both theoretical and experimental Mechanics. The theoretical instruction requires no previous knowledge of Mechanics; the advanced courses presume a fair acquaintance with Physics and sufficient mathematical training to read profitably the standard works on Mechanics. The experimental work comprises (1) graphical constructions, especially in kinematics and statics; (2) exact measurements in physical mechanics.

The laboratory is supplied with motive power, compressed air, and vacuum pipes, gas, water, etc. The equipment includes: one

20,000 lb. Riehle testing machine; one 2,000 lb. Fairbanks cement testing machine; several hand power testing machines; numerous instruments of precision. The University workshop is available for making apparatus for instruction and research.

I. THEORETICAL MECHANICS.—A course designed to give the student a firm grasp of the fundamental principles of Mechanics. (Math. III required.) Lectures with demonstrations and problems, *Tu.*, 12-1, *W.*, 9-10, *Th.*, 12-1, and *F.*, 4-5.—MR. CROOK.

II. ANALYTIC MECHANICS.—This course treats general theoretical mechanics in a more exhaustive way than course I. (Math. IV required.) Lectures and problems, 3 *hrs. a week.*—MR. CROOK. Omitted in 1911-12.

III. APPLIED MECHANICS.—A course in mechanics of materials, static structures, machines, and hydraulics. (Math. IV and Mech. I required.) Lectures, *Tu.*, 11-12, *Th.*, *F.*, 9-10; laboratory, *F.*, 2-4.—MR. CROOK.

THE DEPARTMENT OF ASTRONOMY

This Department has been opened in connection with the operation of the Astronomical Observatory of the University for the training of students in theoretical and practical Astronomy.

I. GENERAL ASTRONOMY.—(Math. I and II and Physics I required.) Lectures, *M.*, *W.*, 10-11, and *S.*, 11-12, *first half-year.*—MR. DOOLITTLE.

II. PRACTICAL ASTRONOMY.—(Astronomy I required.) *M.*, *W.*, 10-11, and *S.*, 11-12, *second half-year.*—MR. DOOLITTLE.

III. ORBIT COMPUTATION.—(Astronomy II and Math. V required.) *Second half-year.*—MR. DOOLITTLE.

Students desiring to take up special work in Practical Astronomy will arrange with the instructor.

The Observatory is situated on the highest point of the University grounds, and is equipped with an equatorially-mounted telescope of nine inches aperture, a meridian circle, a sidereal clock, a chronograph, chronometer, etc.

Electrical Measurements

THE DEPARTMENT OF BIOLOGY

This Department is intended to afford to students preparing for the medical profession, or for advanced courses in Psychology, Economics, or Sociology, an opportunity to acquire a general knowledge of the subject of Biology, as well as to pursue special studies in any of the Biological Sciences.

There is a laboratory fee of $10.00 for course I.

I. GENERAL BIOLOGY.—This course consists of lectures and laboratory work. In the laboratory studies are made of a series of selected types of animals and plants from such simple forms as the amoeba and the haematococcus to the fern, the flowering plant, the frog and the rat. Both the lectures and the laboratory work in this course are designed to give the student a general view of the process of life and growth and of the manifold interrelationships of living things. The large body of interesting phenomena which forms the content of this course, and the training in dealing with the cumulative evidence which it affords, render it a desirable part of a liberal education. Lectures, *M., W.,* 10-11, and *F.,* 12-1; laboratory, *Tu., F.,* 2-4, *first half-year, Tu.,* 3-5, and *F.,* 2-4, *second half-year.*—MR. PARKER.

II. HISTOLOGY.—This course is intended to give the student a practical knowledge of the minute structure of the various organs of the animal body, and to familiarize him with the laboratory technique. Lectures, 1 *hr.* and laboratory 4 *hrs. a week.* Omitted in 1911-12.

III. PHYSIOLOGY.—This course is intended for those who contemplate taking up the study of medicine, as well as for those who intend to pursue graduate work in Physiology or Physiological Psychology. Lectures, 2 *hrs.,* and laboratory, 2 *hrs.* a *week.* Omitted in 1911-12.

IV. GENERAL ZOOLOGY.—This course comprises the elements of Systematic Zoology, Comparative Anatomy and Embryology. Lectures, 2 *hrs.,* and laboratory, 2 *hrs. a week.* Omitted in 1911-12.

THE DEPARTMENT OF BOTANY

The course offered in this Department is intended to give the student a general knowledge of the field of Botany and a foundation for advanced work.

The Herbarium of the University, though not among the largest, is second to none, in the possessions of any institution of importance, as regards North American Botany. It has been augmented by large purchases of Mexican, South American and Polynesian plants, and extensive exchanges with European botanists, and has been further enriched by the gift of the Rev. Father Langlois' large collection, and by a considerable part of that amassed by the late Rev. J. H. Wibbe.

There is a laboratory fee of $10.00 for course I.

I. STRUCTURAL AND FUNCTIONAL BOTANY.—Plant anatomy; plant physiology; plant pathology, with special reference to parasitic fungi. (Biology I required.) Lecture, *W.*, 11-12, and laboratory, *M.*, *W.*, 2-4.—MR. PARKER.

THE DEPARTMENT OF DRAWING

The courses in Drawing have been established to supply the needs not only of those students who are following prescribed courses of study leading to professional careers, but also of those who follow courses in drawing for the training and culture derived therefrom. The work begins with the elements of drafting, and it is planned to develop the student along both theoretical and practical lines.

I.—MECHANICAL DRAWING.—Use of instruments; line shading; problems in geometrical drawing; orthographic and isometric projection; sketching and lettering; tracing and blue-printing. Lecture, *M.*, 11-12; Drafting, *Tu.*, *F.*, 2-5.—MR. CANTWELL.

II. MACHINE DRAWING.—Working drawings of machines and structures; subjects to be chosen with a view to the student's

Astronomical Observatory

Chemical Lecture Room

professional course. (Drawing I required.) Drafting, 4 *hrs. a week, first half-year.*—Mr. Cantwell.

III. Freehand Drawing.—Lettering, construction of titles; sketches of objects with a view to the practical either in projection or perspective. 1 *hr. a week.*—Mr. Cantwell.

IV. Descriptive Geometry.—Elementary principles; problems relating to the point, line and plane; intersection of planes and solids; intersection of solids; development of surfaces, (Drawing I required.) Lectures, *Tu., Th.,* 9-10, and drafting, *Tu., F.,* 2-4; *first half-year.*—Mr. Cantwell.

V. Shades and Shadows.—(Drawing IV required.) Drafting, 4 *hrs., second half-year.*—Mr. Cantwell.

VI. Perspective and Stereotomy.—(Drawing IV required.) Lectures, *W., F.,* 10-11, and drafting, 4 *hrs. a week, second half-year.*—Mr. Cantwell.

THE DEPARTMENT OF ARCHITECTURE

The courses in Architecture are organized to supply the preliminary training required for the practice of architecture. Beginning with drawing, they lead through design, history and construction, enabling the student to take immediate advantage of office opportunities on graduation.

The general course of four years, leading to a degree of bachelor of science in architecture, includes all the essentials of a sound professional training, coupled with a liberal general education such as will equip the student for the many and increasing demands that will be made upon him as an architect.

A special course of two years, leading to a certificate of proficiency in architecture, is arranged to meet the needs of students who have had sufficient preliminary training to warrant taking up the various technical subjects given under the general course. It includes all subjects directly related to the practice of architecture, such as freehand and architectural drawing, water colors and rendering, the Five Orders, design, architectural history and construction.

I. Architectural Drawing.—Beginning with descriptive geometry and orthographic projection, the student takes up shades and shadows, perspective and stereotomy, developing in connection with the study of these subjects the skill necessary to make careful and accurate drawings, illustrations architectural in character being given to familiarize the student with the first principles. Lecture, *M.*, 8-9 p. m., drawing, 1 *hr. a week.*—Mr. Murphy.

II. Freehand Drawing.—The value of a thorough course in freehand drawing as a foundation for artistic expression causes unusual attention to be paid to it. First, objects of simple geometric forms are studied which involve the laws and expression of forms in line, light and shade, composition of simple masses and linear perspective. Then decoration, natural and architectural forms are taken up, and facility and accurate representation are gradually developed. After a satisfactory completion of this work the figures will be studied from casts, and, later, from the living model. Outdoor sketching, as an adjunct to the class room work, will be carried on whenever the weather permits, and is recommended for the summer months. Drawing, *Tu.*, 5-6, and 3 *hrs. additional a week.*—Mr. Murphy.

III. Water Color and Rendering.—Pencil, charcoal and monochrome washes are used as mediums of expression. Painting from still life is given to enable rendering to be taken up intelligently, and the theory and use of color to be worked out. Lecture, 1 *hr. a week, first half-year.*—Mr. Murphy.

IV. Design.—The Five Orders form a natural basis for beginning the work of design. After the study of the best Greek and Roman examples, small sketch problems are given out involving an application of the orders, and are required to be rendered. These problems are exhibited and criticized before the whole class to enable individual students to profit by the work of the others. Sketch problems to be completed in one day compel the concentration of ideas. The work is carefully graded to develop a spirit of emulation from the very beginning. Problems of larger

Drafting

importance succeed the elementary studies, and plan projets requiring most serious consideration are the ultimate object of the course. Lecture, *W.*, 8-9 p. m., problems, 6 *hrs. a week.*—MR. MURPHY.

V. ARCHITECTURAL HISTORY.—To enable the student to grasp the essentials of the great styles, stereopticon lectures accompanied by problems in archæology are held. Many of the important buildings of the world are critically studied and compared, and the decorative sculpture, historic ornament and arrangement in plan in each case analyzed. Lecture, *F.*, 8-9 p. m., drawing, 1 *hr. a week.*—MR. MURPHY.

VI. CONSTRUCTION.—Strength and resistance of materials, structural design, building materials, heating and ventilating, sanitation and illumination are studied by means of lectures, textbooks and visits to buildings in process of erection; at the same time the student is trained, by the preparation of working drawings, in the fundamentals of sound construction. Lecture, *Th.*, 8-9 p. m., drawing, 1 *hr. a week.*—MR. MURPHY.

THE DEPARTMENT OF CIVIL ENGINEERING

The course of studies, both preparatory and professional, has been outlined with a view to laying a substantial foundation to meet the demands of modern engineering practice. Practice is combined with theory as much as possible in an engineering school. Frequent inspection trips are made to points of interest to the civil engineer. The City of Washington is well adapted to this purpose.

The course of studies is broad, as Civil Engineering itself is. In the more advanced work of the senior year an option is offered between the courses of study. Option I, see page 42, is devoted chiefly to a general course in Civil Engineering, particularly to sanitary, hydraulic and municipal work. Option II, see page 42, specializes on railroads.

The program of studies given on pages 41-42 shows the subjects to be completed by the candidate for the degree of Bachelor of Science in Civil Engineering.

I. LAND AND TOPOGRAPHICAL SURVEYING.—Use of chain, tape, compass, transit and level; computation and plotting from notes taken in the field. (Math. III and Drawing I required; Drawing IV to be taken simultaneously.) Lectures, *M.*, *F.*, 9-10; field work, *M.*, 2-5.30.

II. HIGHER SURVEYING.—Triangulation; precise, trigonometric and barometric leveling; stadia and plane-table. (C. E. I required.) *Th.*, 11-1.

III. HIGHWAY ENGINEERING.—Location, construction and maintenance of roads, streets, and pavements. (C. E. IV must be taken simultaneously.) *S.*, 12-1, *first half-year.*

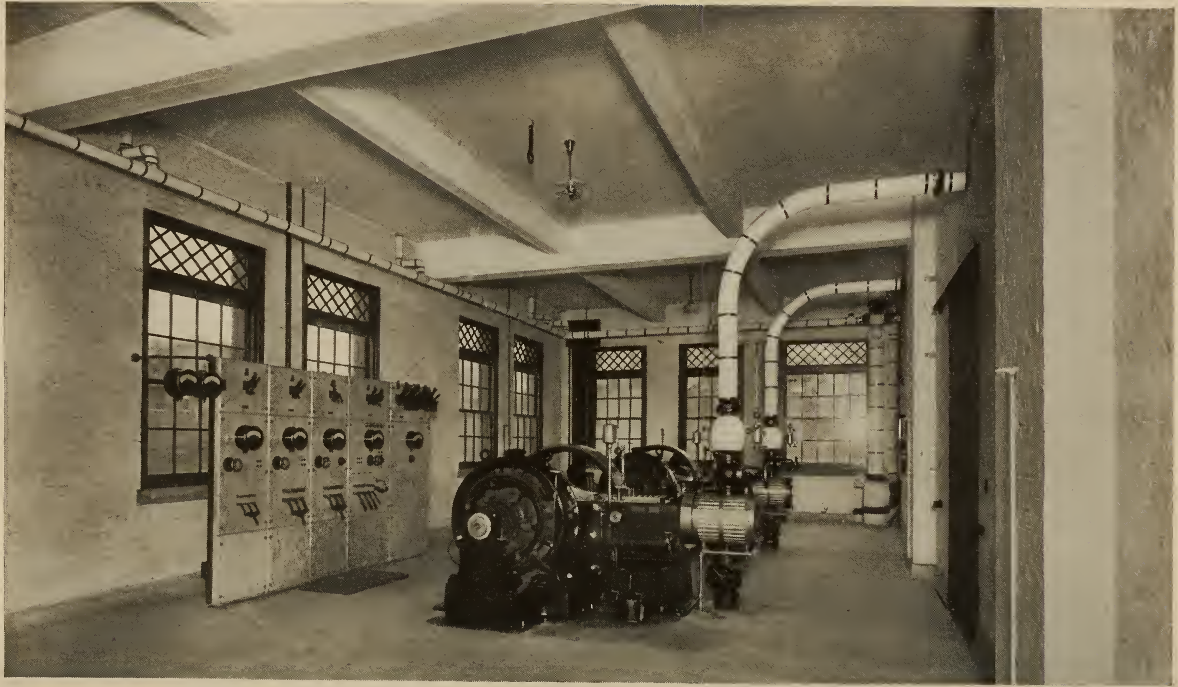
IV. RAILROAD SURVEYING.—Problems and field practice in simple, compound, reverse and transition curves, turnouts and switches, cross-sectioning, staking-out and calculating earth-work quantities; location of a line with preparation of profiles and maps. (C. E. I and Math. IV required.) Lectures, *W.*, 12-1, and *F.*, 10-11; field work, *Th.*, 2-5.30.—MR. MERRIMAN.

V. MATERIALS OF CONSTRUCTION.—The physical characteristics of the materials of construction used by the engineer. *M.*, *F.*, 11-12, *second half-year.*

VI. THEORY OF STRUCTURES.—*First Course.* A study of the loads, reactions, shears and moments acting upon simple structures. (Mech. III required, or to be taken simultaneously.) *Tu.*, *Th.*, *S.*, 10-11, *second half-year.*—MR. MERRIMAN.

VII. THEORY OF STRUCTURES.—*Second Course.* Analysis by graphical and analytical methods of stresses in structures of various kinds. The subjects considered are: the simple beam, plate girders, roof and bridge trusses, trestles, earth-pressure, retaining walls, dams, and the more simple cases of arches, cantilevers, continuous girders, and skeleton frames for buildings. A short course is given in reinforced concrete design. (C. E. VI required.) *M.*, 10-11, *Tu.*, 11-12, *W.*, *F.*, 9-10.—MR. MERRIMAN.

VIII. STRUCTURAL DESIGN.—The computation and design of typical structures, such as a plate girder bridge, wooden roof



Engine Room

truss or highway bridge, and a pin-connected or riveted bridge. (C. E. VII must be taken simultaneously.) *M.*, 11-1, and 2-5.30.—MR. MERRIMAN.

IX. FOUNDATIONS.—A study of the foundations for various structures. Earth foundations, pile-driving and pile foundations, sheet-piling and coffer-dam methods, pneumatic foundations and caisson work. *Th.* 10-11, *second half-year.*

X. THEORETICAL HYDRAULICS.—The principles of hydrostatic and hydrodynamic pressure; the flow of water through orifices and nozzles, over weirs, through pipes and open channels, and the losses from friction and other causes. (Mech. III required.) *Tu., Th., S.*, 10-11, *first half-year.*

XI. SANITARY AND HYDRAULIC ENGINEERING.—Study of the methods of construction and design of sewerage systems; methods of sewage disposal; water supply systems; purification and filtration; irrigation. (C. E. X must be taken simultaneously.) Lectures, *Tu.*, 9-10, *and F.*, 12-1; laboratory, *Tu.*, 3-5, *F.*, 2-4.

XII. RAILROAD ENGINEERING.—Maintenance of track and structures; economics of location, and the elements of operation; design of yards and station grounds and other practical problems. (C. E. IV required.) Lectures *Tu., Th.*, 9-10; fieldwork, *W.*, 10-12, and *F.*, 11-1.—MR. MERRIMAN.

XX. THESIS.—A thesis on some civil engineering subject, approved by the head of the Department, is required of every candidate for the degree Bachelor of Science in Civil Engineering. 6 *hrs. a week, second half-year.*—MR. MERRIMAN.

THE DEPARTMENT OF ELECTRICAL ENGINEERING

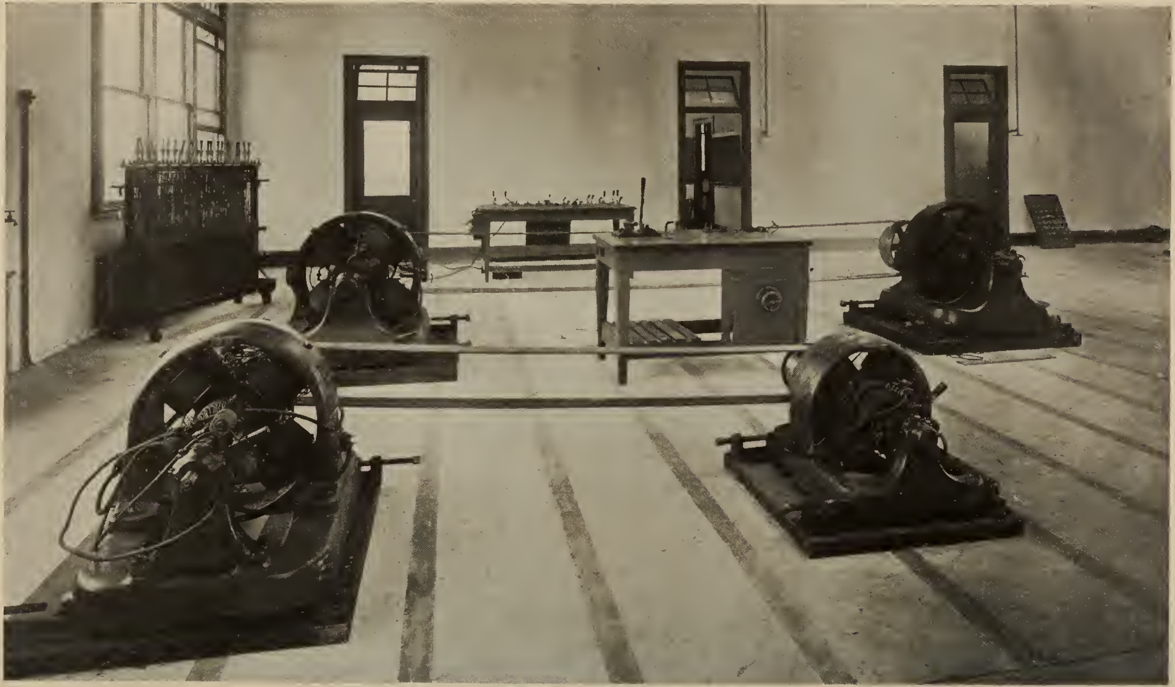
The purpose of this Department is to prepare young men for work as electrical engineers.

The instruction has always in view, for the student, thoroughness, the development of logical thinking and systematic methods of work. Engineering is, for the most part, a practice in analytic and synthetic application requiring such qualities; if the student keeps this always in mind, he will have for his work a most helpful view-point. The courses of instruction are designed to keep those ideas before the student, and to make of him, not a store-house of shifting technical facts, but rather a master of the basic principles of the science of Electrical Engineering.

The lecture rooms and laboratories of this Department occupy much of the second floor of Engineering Building, which has been erected recently to meet the needs of the Departments of Electrical and Mechanical Engineering, and the central heating, lighting and power station. Their nearness to this central station affords immediate power conveniences, and gives the student good opportunities for continuous observation of practical central plant operation.

The equipment is extensive. The size of the apparatus is larger than that usually found in laboratories, and this has advantages that do not obtain with apparatus of low rating. This equipment includes: Two 20 K.W. compound wound generators; a 10-H.P. shunt wound motor; a 12½-H.P. shunt wound motor; a 10 K.W. series wound generator; a 10 K.W. rotary converter; a 10 K.W. A.C. generator for single, two, or three phase; two 5 K.V.A. transformers; two 5-H.P. induction motors; ammeters, voltmeters, wattmeters, shunts and multipliers, for D. C. and A. C. work, of Weston, Westinghouse and General Electric manufacture, both portable and station types; starting and field rheostats, testing tables and such other adjunct apparatus as is necessary for thorough testing.

Washington and its vicinity offers for tours of inspection a varied assortment of electric power plants, large and small. The various forms of equipment and systems of distribution are represented, from the earlier belt drive to the latest turbine installation. In the spring, the fourth year students visit these plants and make a careful and critical study of each, thus gaining an intimate acquaintance with commercial practice, and broadening their knowledge in ways that will greatly benefit them. Among these plants are: The Garfield Park plant, supplying motor-generator sets in the Congressional group of buildings; the Potomac Light



Electrical Testing Laboratory

and Power Company's plant at Bennings, the old plant of the same company, and sub-stations for railway distribution; the Capital Traction Company's plant at Georgetown and its sub-stations; the Washington Terminal Company's plant at the Union Station; the United States Soldiers' Home plant; the United States Navy Yard plant; the Government Printing Office plant; the Washington Asylum plant; the Bureau of Standards; the Washington Post Office plant; the Municipal Building plant; the Great Falls and Old Dominion Railway Company's plant.

There is a laboratory fee of $10.00 for courses I and II in combination; and also for each of the courses III and X.

I. DIRECT CURRENT MACHINERY.—Fundamental principles of direct current generators and motors; practice in their operation and their testing according to the latest commercial practice. (Math. IV and Physics I required, and Physics VI must be taken simultaneously.) Lectures, *M., W., F.,* 10-11, and laboratory, *M., Th.,* 2-4, *S.,* 11-1, *first half-year.*—MR. HARBIN.

II. ALTERNATING CURRENT CIRCUITS.—The study of circuits made up of Resistance, Inductance and Capacity; phase relations; power factor of a circuit; the measurement of electromotive force, current and power, etc. (Math. IV and V and E. E. I required.) Lectures, *M., W., F.,* 10-11, and laboratory, *M., Th.,* 2-4, *and S.,* 11-1, *second half-year.*—MR. HARBIN.

III. ALTERNATING CURRENT MACHINERY.—Fundamental principles of alternating current generators, motors and transformers, and practice in their operation and testing. (Math. IV and V, E. E. I and II required.) Lectures, *Tu., Th., S.,* 9-10; laboratory, *M., W., F.,* 11-1.—MR. HARBIN.

IV. DESIGN OF DIRECT AND ALTERNATING CURRENT MACHINERY.—A. Design of direct current generators and motors with calculations. (Drawing II and E. E. I required.) Lecture, *W.,* 9-10; drawing and computations, 3 *hrs. a week, first half-year.* B. Design of transformers, with calculations. (E. E. II and III required). Lectures, *W.,* 9-10, and drawing and computations, 3 *hrs. a week, second half-year.*—MR. HARBIN.

V. PRIMARY AND SECONDARY BATTERIES.—Theory and testing. (Chem. I and Physics I required.) Lectures and testing, 2 *hrs., fall term.*—MR. HARBIN.

VI. ELECTRIC POWER TRANSMISSION.—Principles and methods of transmitting power by direct and alternating currents. Lectures, computation and inspection, 2 *hrs., winter term.*—MR. HARBIN.

VII. TELEPHONE AND TELEGRAPH.—Theory and testing. (Physics I required.) Lectures, testing and inspection, 2 *hrs., winter term.*—MR. HARBIN.

VIII. ELECTRIC LIGHTING.—Design, installation and operation of direct and alternating systems and plants. Lectures, computation and inspection, 2 *hrs., spring term.*—MR. HARBIN.

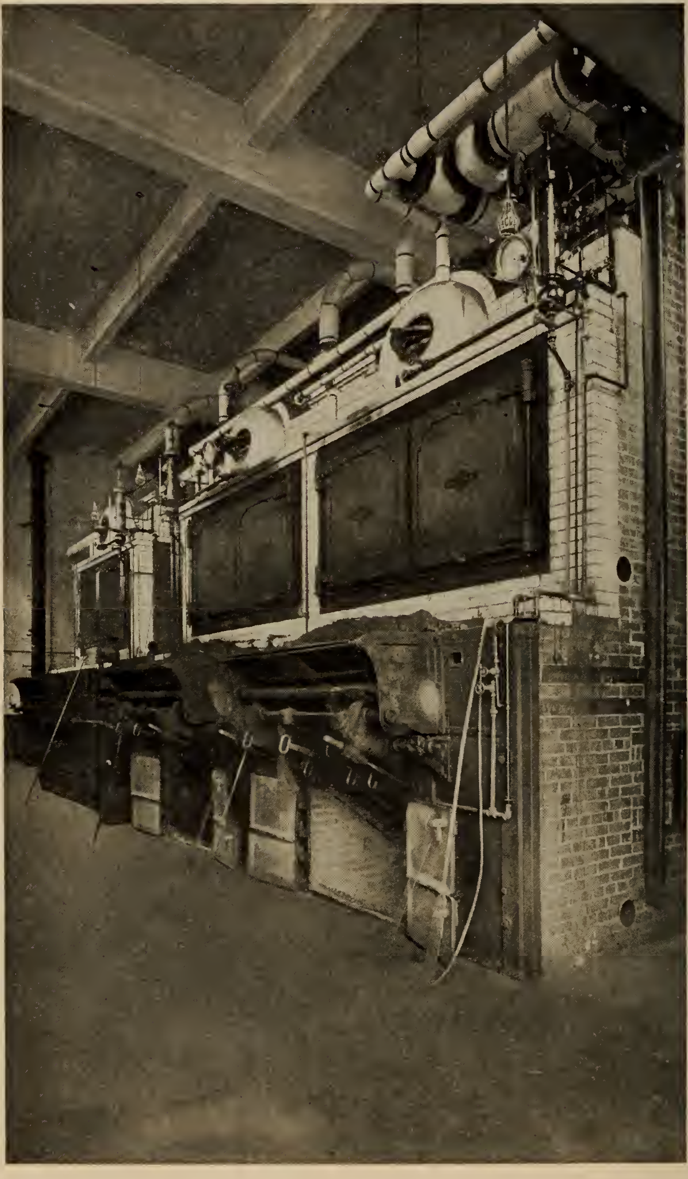
IX. ELECTRIC RAILWAYS.—Construction, equipment and operation. (E. E. VI required.) Lectures and inspection, 2 *hrs., spring term.*—MR. HARBIN.

X. DIRECT AND ALTERNATING CURRENT MACHINERY.—Fundamental principles, testing and practice in operation. This course is open only to students from the other departments of engineering who are in full fourth year standing.. Lectures, *M.,* 9-10., laboratory, 3 *hrs., a week.*—MR. HARBIN.

XI. ELECTRIC POWER PLANT ENGINEERING.—The control of the generation and distribution of electrical energy, with lay-outs of typical plants and sub-stations. The study is along American engineering lines and is exclusively present-day practice. 2 *hrs., second half-year.*—MR. HARBIN.

XX. THESIS.—A thesis on some electrical engineering subject, approved by the head of the Department, is required of every candidate for the degree of Bachelor of Science in Electrical Engineering. 4 *hrs. a week, second half-year.*—MR. HARBIN.

NOTE.—All students before being admitted to the laboratory must equip themselves with slide-rule, cutting-pliers, screw-driver, small wrench and speed-counter.



Boiler Room

THE DEPARTMENT OF MECHANICAL ENGINEERING

This Department offers young men an opportunity to qualify themselves for practical careers as mechanical engineers. The installation of an elaborate central heating, lighting and power station in the new Engineering Building greatly increases the efficiency of the Department.

The mechanical and steam engineering laboratories are so arranged that they can be operated separately or as a unit, and may be run so as to include the central heating, lighting and power plant. There are two distinct laboratories, however: the mechanical and steam laboratory, and the hydraulic laboratory. The flexibility of the two tends to promote a goodly number of experiments, which are both interesting and instructive.

The laboratory equipment in this Department is as follows: Three 200-H.P. Erie water-tube boilers, equipped with Roney stokers, high- and low-water alarm, and automatic feed-pump and damper regulation; two 65-H.P. direct connected Skinner engines; one 25-H.P. Erie Ball engine; one 10-H.P. vertical Troy engine; one 5-H.P. two-cylinder Buffalo Forge engine; one 9½-H.P. Otto gas- and gasoline-engine; one 15-H.P. Vertical fire-tube boiler; one air-compressor; one New York air-brake equipment; two small and two large vacuum steam-pumps; one large and three small steam-pumps; prony brakes; steam injectors; calorimeters; square inch testers; vacuum testing apparatus; planimeters; steam indicators; stand-pipe and tanks containing different shaped weirs, and other necessary apparatus.

With the above equipment the Department is enabled to make the instruction of its students very complete.

There is a laboratory fee of $5.00 for each of the courses III and V, and of $10.00 for course VI.

I. Shopwork.—Carpentry and joinery; wood turning; pattern making; moulding; mixing of metals; foundry; forging; welding; tempering; tool-making; vise-work; use of machine tools; general construction and machine shop work. Lectures, *M., F.,* 9-10; practice, 4 *hrs. a week.*—Mr. Weschler.

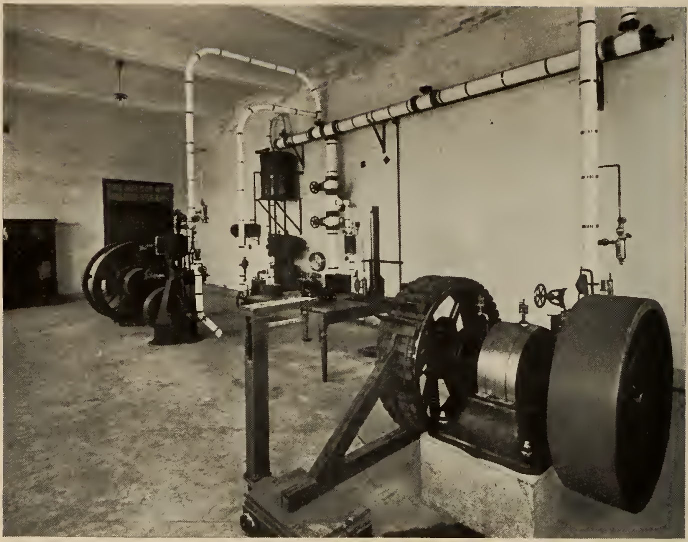
II. Mechanism.—The communication of motion by gearwheels, belts, cams, screws, and link-work; the various means of producing definite changes of velocity; and the principles of epicyclic trains, parallel and quick return motions. (Math. I and III and Physics I required; Math. IV and Mech. I must be taken simultaneously.) Lectures, *Tu., Th.,* 9-10, *and F.,* 12-1, *second half-year.*—Mr. Weschler.

III. Machine Design.—Applied kinematics of machinery; application of Mechanics to calculation of machine parts; the development of working drawings for various machines under discussion. (Math. IV, Mech. I, Drawing IV and M. E. II required; Math. V and Mech. III must be taken simultaneously.) Lectures, *M.,* 2-3, drawing, *M.,* 3-5 *and Th.,* 2-5.—Mr. Weschler.

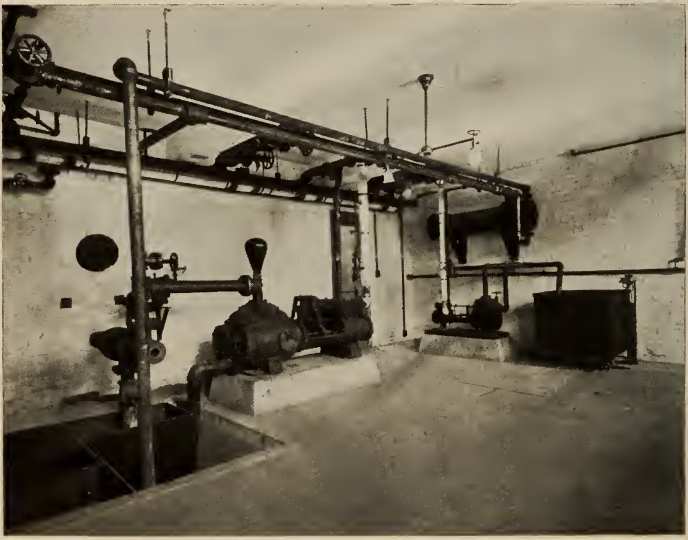
IV. Engines and Boilers.—Theory of the steam engine and its accessories; hot air engines; gas and petroleum engines; water motors. The various forms of steam boilers, their advantages and disadvantages; furnace draft and heating surface; general pumping machinery. (Physics I, Mech. I and M. E. II required.) Lectures, *M.,* 12-1, *Tu., Th., S.,* 10-11, *first half-year,*—Mr. Weschler.

V. Mechanical Engineering Laboratory.—Setting of slide valves; calibration of instruments; taking indicator cards; application of all testing apparatus and auxiliary apparatus used in the engine and boiler room. Laboratory, *Tu.,* 3-5, *and F.,* 2-5, *second half-year.*—Mr. Weschler.

VI. Mechanical Engineering Laboratory.—Continuation of Course V. Calorimeter tests for determining the quality of steam; steam engine and boiler tests; determination of the efficiency of steam and power pumps and steam injectors when operated under various conditions. Tests of engines for the determination of the power developed, the weight of steam used, the interchange of heat between the walls of the cylinder, and the general efficiency of the engine. Experiments in hydraulics for determining the coefficient for the flow of water over weirs, through orifices in thin plates, through short tubes, and through nozzles. (Mech. III and M. E. IV required; C. E. X must be



Steam Engineering Laboratory



Hydraulic Engineering Laboratory

taken simultaneously.) Laboratory, *Tu.*, 3-5 *and F.*, 2-5.—Mr. Weschler.

VII. Thermodynamics.—This course embraces a study of thermal capacities, the laws of thermodynamics, the thermodynamics of gases, saturated vapors and superheated steam. The application of the laws of thermodynamics to the steam engine is shown, and a study is made of steam engine economy by temperature analysis. The types and efficiencies of gas engines, air-compressors, and refrigerating machines are also discussed. (Math. IV, Mech. III and M. E. IV required.) Lectures, *Tu., F., S.*, 11-12.—Mr. Weschler.

VIII. Engine and Power Plant Design.—Design of steam and internal combustion engines, boilers, auxiliaries, coal conveyors, exhaust steam heaters, and economizers, stacks, heating and ventilating and general arrangement of equipment and building. (Mech. III and M. E. III and IV required; M. E. VII must be taken simultaneously.) Lectures, *Tu. and Th.*, 9-10, *first half-year; Tu.*, 12-1, *and Th.*, 10-11, *second half-year;* drawing, 4 *hrs. a week.*—Mr. Weschler.

IX. Seminar.—The reading and discussion of current technical papers and magazines. Students may elect any of the following subjects; heating and ventilating; railroad engineering; steam-power; water-power; gas-power. *M.*, 10-12.—Mr. Weschler.

XX. Thesis.—A thesis on some mechanical engineering subject, approved by the head of the Department, is required of every candidate for the degree Bachelor of Science in Mechanical Engineering. 4 *hrs. a week, second half-year.*—Mr. Weschler.

ADMISSION

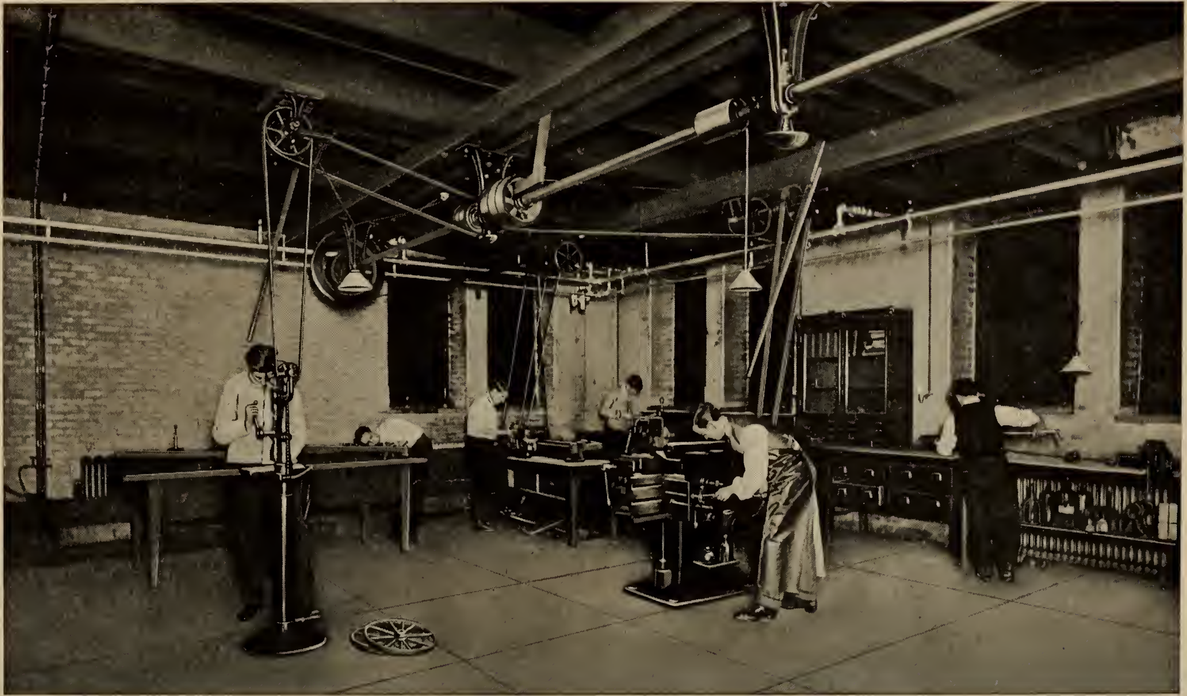
The School of Sciences is open to all male students who are of good moral character and studious habits, and who have attained the standard of scholarship required for admission to any of its departments as contained in the department statements.

ADMISSION FROM AFFILIATED INSTITUTIONS

In pursuance of the General Constitutions of the University and the instructions of the Holy See given in the Apostolic Letter of March 7, 1889, the Board of Trustees have made the following regulation: "Any Catholic institution of learning, whose courses of instruction qualify its students for admission to any Department of the University, may at its own request and without prejudice to its autonomy be enrolled, by order of the Board of Trustees, among the affiliated institutions of the University; and being so enrolled, its graduates shall be admitted to those Departments of the University without examination, upon presentation of the certificates or diplomas which attest their completion of its courses of study."

ADMISSION TO COURSES LEADING TO BACCALAUREATE DEGREES

Applicants for admission to the University who intend following Courses Leading to Baccalaureate Degrees must either pass the Entrance Examinations specified on pages 31 and 32 or present certificates showing attainments equivalent to those indicated by the Entrance Examinations. These certificates may be diplomas from high schools and academies, certificates of examination by some recognized examining board, or certificates of admission to good colleges or universities. The University reserves the right to reject any or all certificates, and to require the passing of the Entrance Examination by any or all applicants. Admission may be granted in spite of failure in some of the subjects of examination, provided they are such as will not embarrass the student in the performance of a full year's work, and may be made up within the first year. Applicants who have extended their studies beyond the requirements of the Entrance Examinations, and who desire advanced standing in the Courses Leading to Baccalaureate Degrees, must further pass examinations in those subjects which they desire counted for advanced standing, or they must present certificates, from colleges or universities, testifying to the satisfactory completion of the subjects.



Machine-Shop

ADMISSION TO COURSES LEADING TO ADVANCED DEGREES

Students who have already received the Baccalaureate degree from a recognized college or university, or who upon entrance pass an examination in any group of studies leading to that degree, are permitted to take up work leading to the Engineer's, Master's or Doctor's degrees offered by the School.

ADMISSION TO COURSES NOT LEADING TO DEGREES

Applicants for admission who desire to pursue only certain studies, must give evidence, by such tests as it is deemed best to apply, of their fitness to follow those studies.

APPLICATION FOR ADMISSION

Persons desiring to become applicants for admission to the University, either for COURSES leading to degrees, or for selected STUDIES in the departments of the School, should obtain from the Registrar of the University, personally or by mail, the blank form of "Application for Admission," should fill it in as completely as possible, and return it to him.

A letter from some responsible person, preferably from the priest of the parish in which the applicant's home residence is situated, testifying that he is of good character, should accompany the application.

ENTRANCE EXAMINATIONS

The subjects in which applicants intending to follow COURSES LEADING TO BACCALAUREATE DEGREES will be examined, in case certificates are not accepted, are the following:

ENGLISH: Reading, study and practice
HISTORY: *Two only of*
    Ancient History

Mediæval and Modern History
English History
American History and Civil Government

LATIN[1]: Grammar, Composition, Cæsar, Nepos, Cicero, Vergil, *or*
GREEK: Grammar, Composition, Xenophon, Homer
FRENCH: Elementary, *or*
GERMAN: Elementary
FRENCH: Intermediate and Advanced, *or*
GERMAN: Intermediate and Advanced, *or*
SPANISH
MATHEMATICS: Elementary Algebra complete; Plane and Solid Geometry
PHYSICAL AND BIOLOGICAL SCIENCES, ETC.: *Two only of*
Chemistry
Physics
Geography
Botany
Zoölogy
Drawing
Music

The definition of requirements in each subject is that contained in document No. 48 of the COLLEGE ENTRANCE EXAMINATION BOARD[2].

DEGREES

The University will confer the following degrees upon students in the School of Sciences who may be qualified to receive them: Bachelor of Science (B.S.); Bachelor of Science in Civil Engineering (B.S. in Civil Engineering); Bachelor of Science in

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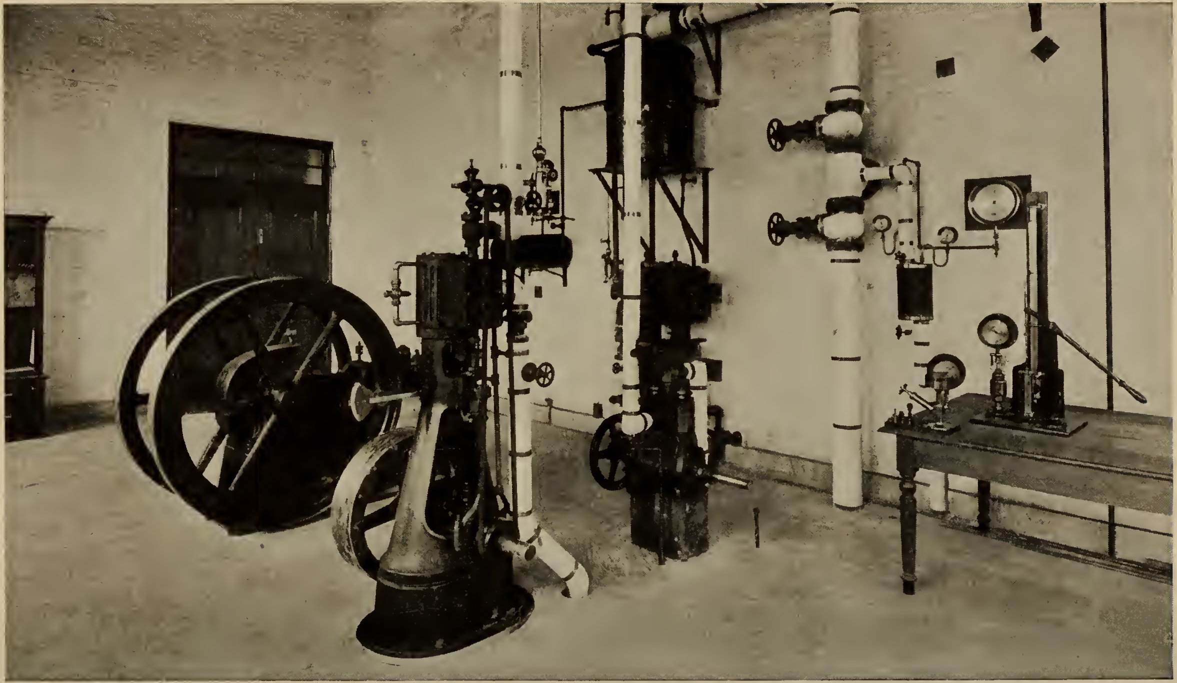
[1] Required only of applicants for admission who intend following the bachelor of arts course.

[2] Copies of this document can be obtained by remitting ten cents in money or postage stamps to the COLLEGE ENTRANCE EXAMINATION BOARD, Post Office Substation 84, New York, N. Y.



Steam Engineering Laboratory

Electrical Engineering (B.S. in Electrical Engineering); Bachelor of Science in Chemical Engineering (B.S. in Chemical Engineering); Bachelor of Science in Mechanical Engineering (B.S. in Mechanical Engineering); Bachelor of Science in Architecture (B.S. in Architecture); Master of Science (M.S.); Doctor of Science (Sc.D.); Electrical Engineer (E.E.); Civil Engineer (C.E.); Mechanical Engineer (M.E.); Bachelor of Arts (A.B.); Master of Arts (A.M.); Doctor of Philosophy (Ph.D.)

The periods of study required for the different degrees may vary with the character and scope of the subjects of study, and with the attainments of the student at the time of his admission to the University. In ordinary cases, four years are required for the Bachelor's degree; two additional years for the Engineer's or Master's degree; and two more years for the Doctor's degree.

Degrees may be granted at any period in the academic year. The public award of diplomas occurs on Graduation Day.

Students who are candidates for degrees should make, through the Faculty, written application to the Rector for the degrees, at least one year before the date at which they may be conferred.

REQUIREMENTS FOR DEGREES

FOR THE BACHELOR'S DEGREE

The student must complete all the subjects in some one of the Courses Leading to Baccalaureate Degrees (See pages 36-44). He must also pass oral degree examinations on all the subjects, in addition to the semi-annual and annual written course examinations.

FOR THE ENGINEER'S AND MASTER'S DEGREES

The Engineer's and Master's degree implies that the student is familiar with the history, actual status, literature, and methods of science which he elects as his specialty. Hence he must follow an approved Course of Study, and must:

1. Spend at least two years in graduate study, the last of which must be at this University.
2. Fulfill the requirements in a major[1] subject and a minor[2] subject, in departments under the Faculty of Sciences.
3. Submit an acceptable dissertation embodying either the results of an original investigation or a critical study of some important work in his major subject.
4. Pass oral degree examinations in his major and minor subjects, in addition to the semi-annual and annual written course examinations.
5. At the option of the University, print the dissertation, in whole or in part, and present the University with one hundred copies.

FOR THE DOCTOR'S DEGREE

The Doctorate in Science or in Philosophy implies that the student has attained a certain breadth of view along with a special knowledge of his subject in all its details and bearings, and has given evidence of his ability to conduct independent research. Hence he must follow an approved Course of Study and must:

1. Spend at least three years in graduate study, the last of which must be at this University.
2. Fulfill the requirements in a major subject and in two minor subjects, of which the major and one minor must be in departments under the Faculty of Sciences, the other minor may be in a department under any faculty.
3. Submit an acceptable dissertation embodying the results of an original investigation in the major subject.
4. Pass oral degree examinations in his major and minor subjects, in addition to the semi-annual and annual written course examinations.

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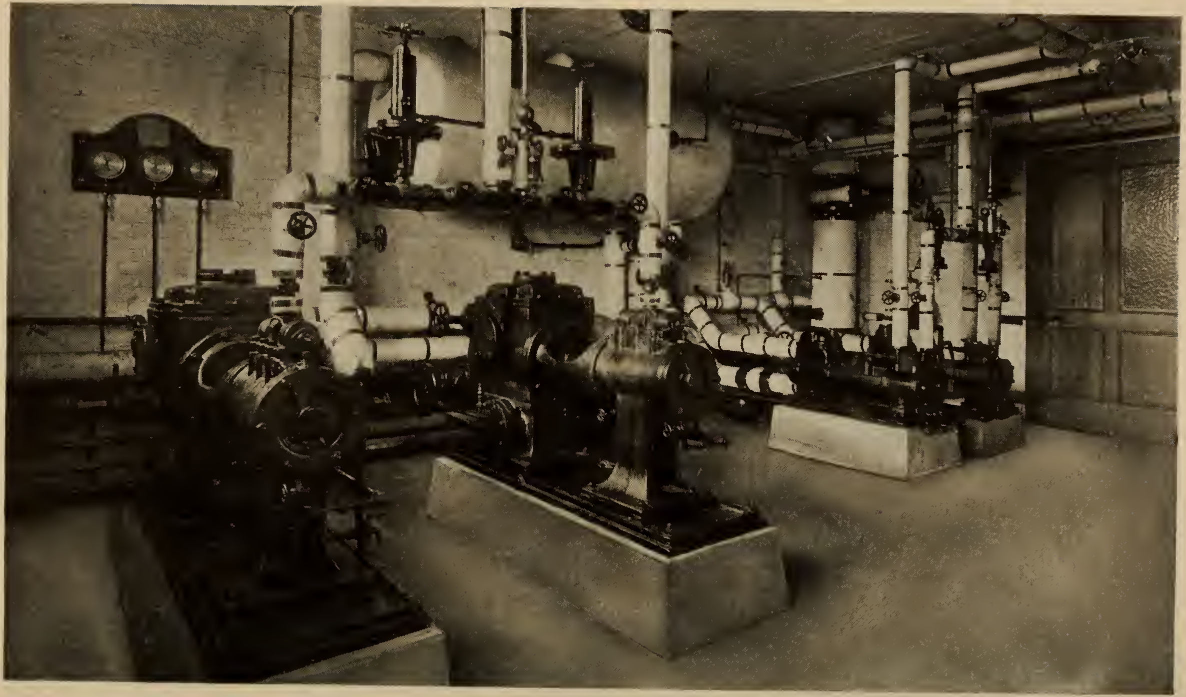
[1] By a major subject is meant several of the more advanced Courses of Instruction in some one department.

[2] By a minor subject is meant one or more of the more advanced Courses of Instruction in some one department.



Pump-Room

5. Print the dissertation in whole or in part,—if in part to the extent of not less than twenty-five octavo pages,—and present the University with two hundred copies of the work. If the dissertation has not already been printed, the candidate must deposit $50 before receiving his diploma, to insure its being printed within a year. This deposit will be returned to him on the presentation of the printed copies.

COURSES LEADING TO BACCALAUREATE DEGREES

In estimating credits, one lecture hour per week for a year is taken as the unit; two laboratory or drafting hours are rated as equivalent to one lecture hour.

Subjects not in the departments of this school are described in the Year Book, in the statements of other schools.

I. BACHELOR OF ARTS

FIRST YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. I (Advanced Algebra) Math. II (Trigonometry)....	5	Math. III (Analytic Geometry)	5
Chem. I........................	6	Chem. I........................	6
English I and II...............	3	English I and II...............	3
French I, or German I.........	3	French I, or German I.........	3
History III (American Political History)	3	History III (American Political History)	3
Christian Doctrine I............	1	Christian Doctrine I............	1

Total Credits for the year...... 21

SECOND YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Physics I.......................	5	Physics I.......................	5
Biology I......................	5	Biology I......................	5
English III, IV and V..........	3	English IV, V and VI..........	3
French II, or German II........	3	French II, or German II.......	3
Christian Doctrine I............	1	Christian Doctrine I...........	1
Elective	4	Elective	4

Total Credits for the year...... 21

THIRD AND FOURTH YEARS

All of the Third and Fourth Year studies are elective, except that Christian Doctrine must be taken in both years (one hour per week in each);[1] Philosophy must be taken for at least one year (three hours per week); and, in each year, the total number of credits must amount to not less than twenty-one, of which not less than eleven must be for work done in the School of Sciences.

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[1] Non-Catholic students are permitted to substitute for the courses in Christian Doctrine an equivalent number of hours' work in electives offered by the University.

II. BACHELOR OF SCIENCE

FIRST YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. I (Advanced Algebra)	5	Math. III (Analytic Geometry)	5
Math. II (Trigonometry)		Chem. I	6
Chem. I	6	Drawing I (Mechanical Drawing)	4
Drawing I (Mechanical Drawing)	4	Drawing III (Freehand Drawing)	
Drawing III (Freehand Drawing)		English I and II	3
English I and II	3	French I, or German I	3
French I, or German I	3	Christian Doctrine I	1
Christian Doctrine I	1		

Total credits for the year...... 22

This first-year schedule is common to all courses leading to the various Bachelor of Science degrees.

SECOND YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. IV (Calculus)	4	Math. IV (Calculus)	4
Physics I	5	Physics I	5
Mech. I (Theoretical Mechanics)	3	Mech. I (Theoretical Mechanics)	3
Drawing IV (Descriptive Geometry)	4	Biology I	5
Biology I	5	English IV, V and VI	3
English III, IV and V	3	Christian Doctrine I	1
Christian Doctrine I	1		

Total credits for the year...... 23

THIRD AND FOURTH YEARS

All of the Third and Fourth Year studies are elective, except that Christian Doctrine must be taken in both years (one hour per week in each);[1] Philosophy must be taken for at least one year (three hours per week); and, in each year, the total number of credits must amount to not less than twenty-one, of which not less than fourteen must be for work done in the School of Sciences.

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[1] Non-Catholic students are permitted to substitute for the courses in Christian Doctrine an equivalent number of hours' work in electives offered by the University.

BACHELOR OF ARTS, OR OF SCIENCE PREPARATORY TO MEDICINE

Students who contemplate taking up the study of Medicine, on the completion of the Bachelor of Arts or Bachelor of Science Course, are advised to include among their electives as many as possible of the following studies: Biology II (Histology); Biology III (Physiology); Biology IV (General Zoology); Botany I (Structural and Functional Botany); Chemistry II (Organic Chemistry); Physics II (Advanced Theoretical and Experimental Physics); Philosophy IV (Experimental Psychology); Philosophy VI (Principles of Physiological Psychology).

III. BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

FIRST YEAR. See page 37

SECOND YEAR

FIRST HALF-YEAR		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. IV (Calculus)	4	Math. IV (Calculus)	4
Chem. II (Organic Chemistry)	5	Chem. II (Organic Chemistry)	5
Physics I	5	Physics I	5
Mech. I (Theoretical Mechanics)	3	Mech. I (Theoretical Mechanics)	3
Drawing IV (Descriptive Geometry)	4	English IV, V and VI	3
English III, IV and V	3	Christian Doctrine I	1
Christian Doctrine I	1		
Total credits for the year	23		

THIRD YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. V (Integral Calculus)	4	Chem. III (Quantitative Analysis)	4
Chem. III (Quantitative Analysis)	4	Chem. VI (Water and Gas Analysis)	3
Mech. III (Applied Mechanics)	4	Mech. III (Applied Mechanics)	4
Biology I	5	Biology I	5
Philosophy I	3	Philosophy II	3
Christian Doctrine III	1	Christian Doctrine III	1
Total credits for the year	20½		

FOURTH YEAR

FIRST HALF-YEAR. Subject	Half-credits	SECOND HALF-YEAR. Subject	Half-credits
Chem. V (Electro-Chemical Analysis)	3	Chem. IV (Physical Chemistry)	3
Chem. VII (Industrial Chemistry)	3	Chem. VII (Industrial Chemistry)	3
Chem. VIII (Metallurgy)	3	Chem. VIII (Metallurgy)	3
C. E. XI (Sanitary and Hydraulic Engineering)	4	C.E. XI (Sanitary and Hydraulic Engineering)	4
E. E. X (Direct and Alternating Current Machinery)	3	E.E. X (Direct and Alternating Current Machinery)	3
Economics I	3	Gen'l Law Lectures II (Practical Business Law)	1
Christian Doctrine III	1	Economics I	3
		Christian Doctrine III	1

Total credits for the year......20½

IV. BACHELOR OF SCIENCE IN ARCHITECTURE

FIRST YEAR. See page 37

SECOND YEAR

FIRST HALF-YEAR. Subject	Half-credits	SECOND HALF-YEAR. Subject	Half-credits
Math. IV (Calculus)	4	Math. IV (Calculus)	4
Physics I	5	Physics I	5
Mech. I (Theoretical Mechanics)	3	Mech. I (Theoretical Mechanics)	3
Drawing IV (Descriptive Geometry)	4	Drawing V (Shades and Shadows)	2
Arch. II (Freehand Drawing)	2	Arch. II (Freehand Drawing)	2
Arch. IV (Design)	4	Arch. IV (Design)	4
English III, IV and V	3	Arch. V (Architectural History)	2
Christian Doctrine I	1	English IV, V and VI	3
		Christian Doctrine I	1

Total credits for the year 26

THIRD YEAR

FIRST HALF-YEAR.

Subject	Half-credits
Mech. III (Applied Mechanics)	4
†Arch. I (Architectural Drawing)	3
†Arch. VI (Construction)	
Arch. III (Water Color and Rendering)	1
Arch. II (Freehand Drawing)	2
Arch. IV (Design)	4
Arch. V (Architectural History)	2
*Heating and Ventilation	3
Philosophy I	3
Christian Doctrine III	1

SECOND HALF-YEAR.

Subject	Half-credits
Mech. III (Applied Mechanics)	4
Drawing VI (Perspective and Stereotomy)	4
†Arch. I (Architectural Drawing)	3
†Arch. VI (Construction)	
Arch. II (Freehand Drawing)	2
Arch. V (Architectural History)	2
C.E. VI (Theory of Structures)	3
C.E. IX (Foundations)	1
Philosophy II	3
Christian Doctrine III	1

Total credits for the year....... 23

FOURTH YEAR

FIRST HALF-YEAR.

Subject	Half-credits
Arch. II (Freehand Drawing)	2
*History of Civilization and Art	3
*Landscape Architecture	4
C.E. VII (Theory of Structures)	4
C.E. VIII (Structural Design)	3
C.E. XI (Sanitary and Hydraulic Engineering)	4
E.E. X (Direct and Alternating Current Machinery)	3
Economics I	3
Christian Doctrine III	1

SECOND HALF-YEAR.

Subject	Half-credits
Arch. II (Freehand Drawing)	2
*History of Civilization and Art	3
C.E. VII (Theory of Structures)	4
C.E. VII (Structural Design)	3
C.E. XI (Sanitary and Hydraulice Engineering)	4
E.E. X (Direct and Alternating Current Machinery)	3
Gen'l Law Lectures II (Practical Business Law)	1
Economics I	3
Christian Doctrine III	1

Total credits for the year......25½

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*The courses in Heating and Ventilation, History of Civilization and Art, and Landscape Architecture will be provided for when a sufficient number of students make application for them.

†These courses include working drawings and specifications.

V. BACHELOR OF SCIENCE IN CIVIL ENGINEERING

FIRST YEAR. See page 37

SECOND YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. IV (Calculus)	4	Math. IV (Calculus)	4
Physics I	5	Physics I	5
Mech. I (Theoretical Mechanics)	3	Mech. I (Theoretical Mechanics)	3
Drawing IV (Descriptive Geometry)	4	C.E. I (Land and Topographical Surveying)	4
C.E. I (Land and Topographical Surveying)	4	M.E. II (Mechanism)	3
English III, IV and V	3	English IV, V and VI	3
Christian Doctrine I	1	Christian Doctrine I	1

Total credits for the year......23½

THIRD YEAR

FIRST HALF-YEAR.		SECOND HALF-YEAR.	
Subject	Half-credits	Subject	Half-credits
Math. V (Integral Calculus)	4	Mech. III (Applied Mechanics)	4
Mech. III (Applied Mechanics)	4	Astronomy II	3
Astronomy I	3	C.E. II (Higher Surveying)	2
C.E. II (Higher Surveying)	2	C.E. IV (Railroad Surveying)	4
C.E. III (Highway Engineering)	1	C.E. V (Materials of Construction)	2
C.E. IV (Railroad Surveying)	4	C.E. VI (Theory of Structures)	3
M.E. IV (Engines and Boilers)	4	Philosophy II	3
Philosophy I	3	Christian Doctrine III	1
Christian Doctrine III	1		

Total credits for the year....... 24

FOURTH YEAR

FIRST HALF-YEAR.

Subject	Half-credits
C.E. VII (Theory of Structures)	4
C.E. VIII (Structural Design)	3
C.E. X (Hydraulics)	3
E.E. X (Direct and Alternating Current Machinery	3
Economics I	3
Christian Doctrine III	1
and either	
Option (1)	
C.E. XI (Sanitary and Hydraulic Engineering)	4
or	
Option (2)	
C.E. XII (Railroad Engineering)	4

SECOND HALF-YEAR.

Subject	Half-credits
C.E. VII (Theory of Structures)	4
C.E. VIII (Structural Design)	3
C.E. IX (Foundations)	1
C.E. XX (Thesis)	3
E.E. X (Direct and Alternating Current Machinery	3
Gen'l Law Lectures II (Practical Business Law)	1
Economics I	3
Christian Doctrine III	1
and either	
Option (1)	
C.E. XI (Sanitary and Hydraulic Engineering)	4
or	
Option (2)	
C.E. XII (Railroad Engineering)	4

Total credits for the year....... 22

VI. BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

FIRST YEAR. See page 37

SECOND YEAR

FIRST HALF-YEAR.

Subject	Half-credits
Math. IV (Calculus)	4
Physics I	5
Mech. I (Theoretical Mechanics)	3
Drawing II (Machine Drawing)	2
Drawing IV (Descriptive Geometry)	4
M.E. I (Shopwork)	4
English III, IV and V	3
Christian Doctrine I	1

SECOND HALF-YEAR.

Subject	Half-credits
Math. IV (Calculus)	4
Physics I	5
Mech. I (Theoretical Mechanics)	3
M.E. I (Shopwork)	4
M.E. II (Mechanism)	3
English IV, V and VI	3
Christian Doctrine I	1

Total credits for the year......24½

THIRD YEAR

FIRST HALF-YEAR. Subject	Half-credits	SECOND HALF-YEAR. Subject	Half-credits
Math. V (Integral Calculus)	4	Mech. III (Applied Mechanics)	4
Mech. III (Applied Mechanics)	4	Physics VI (Magnetism and Electricity)	3
Physics VI (Magnetism and Electricity)	3	C.E. VI (Theory of Structures)	3
E.E. I (Direct Current Machinery)	6	E.E. II (Alternating Current Circuits)	6
M.E. IV (Engines and Boilers)	4	Philosophy II	3
Philosophy I	3	Christian Doctrine III	1
Christian Doctrine III	1	M.E. V (M.E. Laboratory)	2

Total credits for the year.....23½

FOURTH YEAR

FIRST HALF-YEAR. Subject	Half-credits	SECOND HALF-YEAR. Subject	Half-credits
C.E. X (Hydraulics)	3	E.E. III (Alternating Current Machinery)	6
E.E. III (Alternating Current Machinery)	6	E.E. IV (A.C. Machine Design)	3
E.E. IV (D. C. Machine Design)	3	E.E. VIII (Electric Lighting) E.E. IX (Electric Railways)	2
E.E. VI (Electric Power Transmission) E.E. VII (Telephone and Telegraph) E.E. V (Primary and Secondary Batteries)	2	E.E. XI (Electric Power Plant Engineering)	2
M.E. VI (M.E. Laboratory)	3	E.E. XX (Thesis)	3
Economics I	3	Gen'l Law Lectures II (Practical Business Law)	1
Christian Doctrine III	1	Economics I	3
		Christian Doctrine III	1

Total credits for the year........21

VII. BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

FIRST YEAR. See page 37

SECOND YEAR

FIRST HALF-YEAR.

Subject	Half-credits
Math. IV (Calculus)	4
Physics I	5
Mech. I (Theoretical Mechanics)	3
Drawing II (Machine Drawing)	2
Drawing IV (Descriptive Geometry)	4
M.E.I. (Shopwork)	4
English III, IV and V	3
Christian Doctrine I	1

SECOND HALF-YEAR.

Subject	Half-credits
Math. IV (Calculus)	4
Physics I	5
Mech. I (Theoretical Mechanics)	3
M.E.I. (Shopwork)	4
M.E. II (Mechanism)	3
English IV, V and VI	3
Christian Doctrine I	1

Total credits for the year......24½

THIRD YEAR

FIRST HALF-YEAR.

Subject	Half-credits
Math. V (Integral Calculus)	4
Chem. VIII (Metallurgy)	3
Mech. III (Applied Mechanics)	4
M.E. III (Machine Design)	4
M.E. IV (Engines and Boilers)	4
Philosophy I	3
Christian Doctrine III	1

SECOND HALF-YEAR.

Subject	Half-credits
Chem. VIII (Metallurgy)	3
Mech. III (Applied Mechanics)	4
C.E. V (Materials of Construction)	2
C.E. VI (Theory of Structures)	3
M.E. III (Machine Design)	4
M.E. V (M.E. Laboratory)	3
Philosophy II	3
Christian Doctrine III	1

Total credits for the year...... 23

FOURTH YEAR

FIRST HALF-YEAR.

Subject	Half-credits
C.E. X (Hydraulics)	3
E.E. X (D. and A.C. Machinery)	3
M.E. VI (M.E. Laboratory)	3
M.E. VII (Thermodynamics)	3
M.E. VIII (Engine and Power Plant Design)	4
M.E. IX (Seminar)	2
Economics I	3
Christian Doctrine III	1

SECOND HALF-YEAR.

Subject	Half-credits
E.E. X (D. and A. C. Machinery)	3
M.E. VI (M. E. Laboratory)	3
M.E. VII (Thermodynamics)	3
M.E. VIII (Engine and Power Plant Design)	4
M.E. IX (Seminar)	2
M.E. XX (Thesis)	3
Gen'l Law Lectures II (Practical Business Law)	1
Economics I	3
Christian Doctrine III	1

Total credits for the year......22½

FEES, EXPENSES, RESIDENCE, SESSIONS

FEES AND EXPENSES

The annual fee for tuition is one hundred dollars, payable semi-annually in advance. Laboratory expenses are not included in tuition fees. The graduation fees are: for the degree of Bachelor, five dollars; for the degree of Master or Engineer, ten dollars; for the degree of Doctor, twenty-five dollars.

The following persons may be exempted from the payment of tuition, but not from laboratory fees, at the discretion of the Rector: (1) students who render scholastic services to the University as tutors, clerks, etc.; (2) students of narrow means who attain high merit at the annual examination; (3) graduates of Catholic educational institutions who are unable to pay full tuition fees, and who present to the Rector a certificate from the President of the institutions stating that the applicant attained high rank at his graduation examination. Exemption from tuition fees is also granted to students belonging to the religious Orders or Communities, to all grades of clerical students, and to one graduate at a time of every Catholic college which confers the Bachelor's degree, who presents a certificate from the President of the college that at the degree examination of the preceding academic year he attained a high rank. Any of these privileges and exemptions may be forfeited by bad conduct or neglect of studies.

The expenses for board and lodging need not exceed thirty dollars per month. Expenses for books, laboratory supplies, etc., will depend upon the courses which the students may pursue.

RESIDENCE

Lay students are required to live at ALBERT HALL, or at approved private residences. For information concerning rooms and board in ALBERT HALL, address its President.

10	C. E. VII (Theory of Structures) (4) M. E. IX (M. E. Seminar) (4)		Drawing VI (Perspective and Stereotomy) (3) C. E. XII Laboratory (4) Chem. VIII Laboratory (4)	Structures) (3) C. E. IX (Foundations) (4) M. E. VIII (E. and P. P. Design) (4)	Circuits) (3) Drawing VI (Perspective and Stereotomy) (3)	atory (Section C) (2) C. E. VI (Theory of Structures) (3)
11	Drawing I (Mechanical Drawing) (1) Physics I (2) C. E. V (Materials of Construction) (3) C. E. VIII (Structural Design) (4) E. E. III (Laboratory) (4) M. E. IX (M. E. Seminar) (4)	German I (1) English VI (2) Physics II (3) Mech. III (Applied Mechanics) (3) C. E. VII (Theory of Structures) (4) M. E. VII (Thermodynamics) (4)	German I (1) Physics I (2) Botany I (3) C. E. XII Laboratory (4) E. E. III Laboratory (4) Chem. VIII Laboratory (4)	German I (1) English IV (2) Physics VI (Magnetism and Electricity) (3) C. E. II (Advanced Surveying) (3) E. E. X Laboratory (4)	Physics I (2) C. E. V (Materials of Construction) (3) C. E. XII Laboratory (4) E. E. III Laboratory (4) M. E. VII (Thermodynamics) (4)	Physics I Laboratory (Section C) (2) Astronomy II (3) E. E. II Laboratory (3) M. E. VII (Thermodynamics) (4)
12	Math. III (Section B) (1) Math. IV Problem Work (2) C. E. VIII (Structural Design) (4) E. E. III Laboratory (4)	Math. III (Section B) (1) Mech. I (Theoretical Mechanics) (2) E. E. X Laboratory (4) M. E. VIII (E. and P. P. Design) (4)	English II (1) C. E. IV (R. R. Surveying) (3) Chem. VIII (Metallurgy) (4) E. E. III Laboratory (4)	Math. III (Section B) (1) Mech. I (Theoretical Mechanics) (2) C. E. II (Advanced Surveying) (3) E. E. X Laboratory (4)	Math. III (Section B) (1) Biology I (2) M. E. II (Mechanism) (2) C. E. XI (Sanitary and Hydraulic Eng'g) (4) C. E. XII Laboratory (4) E. E. III Laboratory (4)	Physics I Laboratory (2) E. E. II Laboratory (3)
P. M. 2	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) Botany I Laboratory (3) E. E. II Laboratory (3) M. E. III (Ma-	Drawing I Laboratory (1) Physics I Laboratory (Section A) (2) Christian Doctrine III (3) (4)	Christian Doctrine I (1) (2) Physics II Laboratory (3) Physics VI Laboratory (3) Botany I Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) E. E. II Laboratory (3) M. E. III Design (3)	Drawing I Laboratory (1) Biology I Laboratory (2) Mech. III Laboratory (3) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	

SCHEDULE OF HOURS

SUBJECTS PRESCRIBED FOR BACCALAUREATE DEGREES IN THE SCHOOL OF SCIENCES

1911-1912

FIRST HALF-YEAR

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A. M. 8				Economics I (4)	Economics I (4)	Economics I (4)
9	Math. I and II (Section A) (1) Chem. II (Organic Chemistry) (2) C. E. I (Surveying) (2) M. E. I (Shopwork) (2) Philosophy I (3) E. E. X (D. and A. C. Machinery) (4)	Drawing IV (Descriptive Geometry) (2) Philosophy I (3) C. E. XI (Sanitary and Hydraulic Eng'g) (4) E. E. III (A. C. Machinery) (4) M. E. VIII (E. and P. P. Design) (4) C. E. XII (R. R. Eng'g) (4)	Math. I and II (Section A) (1) Mech. I (Theoretical Mechanics) (2) Philosophy I (3) C. E. VII (Theory of Structures) (4) E. E. IV (D. C. Machine Design) (4)	Math. I and II (Section A) (1) Drawing IV (Descriptive Geometry) (2) Mech. III (Applied Mechanics) (3) C. E. XII (R. R. Eng'g) (4) E. E. III (A. C. Machinery) (4) M. E. VIII (E. and P. P. Design) (4)	Math. I and II (Section A) (1) Chem. II (Organic Chemistry) (2) C. E. I (Surveying) (2) M. E. I (Shopwork) (2) Mech. III (Applied Mechanics) (3) C. E. VII (Theory of Structures) (4)	Math. I and II (Section A) (1) Physics I Laboratory (Section C) (2) Math. V (Integral Calculus) (3) E. E. III (A. C. Machinery) (4)
10	Chem. I (1) Biology I (2) E. E. I (D. C. Machinery) (3) Astronomy I (3) M. E. IX (M. E. Seminar) (4) C. E. VII (Theory of Structures) (4)	English I (1) Math. IV (Calculus) (2) M. E. IV (Engines and Boilers) (3) C. E. X (Hydraulics) (4)	Chem. I (1) Biology I (2) Astronomy I (3) E. E. I (D. C. Machinery) (3) C. E. XII Laboratory (4)	English I (1) Math. IV (Calculus) (2) M. E. IV (Engines and Boilers) (3) C. E. X (Hydraulics) (4)	Chem. I (1) English V (2) E. E. I (D. C. Machinery) (3) C. E. IV (R. R. Surveying) (3)	Math. I and II (Section B) (1) Math. IV (Calculus) (2) Physics I Laboratory (Section C) (2) M. E. IV (Engines and Boilers) (3) C. E. X (Hydraulics) (4)
11	Drawing I (Mechanical Drawing) (1) Physics I (2) Math. V (Integral Calculus) (3) C. E. VIII (Structural Design) (4) E. E. III Laboratory (4) M. E. IX (M. E. Seminar) (4)	German I (1) English III (2) Physics II (3) Mech. III (Applied Mechanics) (3) C. E. VII (Theory of Structures) (4) M. E. VII (Thermodynamics) (4)	German I (1) Physics I (2) Math. V (Integral Calculus) (3) Botany I (3) C. E. XII Laboratory (4) E. E. III Laboratory (4)	German I (1) English IV (2) Physics VI (Magnetism and Electricity) (3) C. E. II (Advanced Surveying) (3) E. E. X Laboratory (4)	Physics I (2) Math. V (Integral Calculus) (3) C. E. XII Laboratory (4) E. E. III Laboratory (4) M. E. VII (Termodynamics) (4)	Physics I Laboratory (Section C) (2) Astronomy I (3) E. E. I Laboratory (3) M. E. VII (Thermodynamics) (4)
12	Math. I and II (Section B) (1) Math. IV Problem Work (2) M. E. IV (Engines and Boilers) (3) C. E. VIII (Structural Design) (4) E. E. III Laboratory (4)	Math. I and II (Section B) (1) Mech. I (Theoretical Mechanics) (2) E. E. X Laboratory (4)	English II (1) C. E. IV (R. R. Surveying) (3) E. E. III Laboratory (4) Chem. VIII (Metallurgy) (4)	Math. I and II (Section B) (1) Mech. I (Theoretical Mechanics) (2) C. E. II (Advanced Surveying) (3) E. E. X Laboratory (4)	Math. I and II (Section B) (1) Biology I (2) C. E. XI (Sanitary and Hydraulic Eng'g) (4) C. E. XII Laboratory (4) E. E. III Laboratory (4)	Physics I Laboratory (Section C) (2) C. E. III (Highway Eng'g) (3) E. E. I Laboratory (3)
P. M. 2	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Botany I Laboratory (3) Physics II Laboratory (3) E. E. I Laboratory (3) M. E. III (Machine Design) (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) Physics I Laboratory (Section A) (2) Biology I Laboratory (2) Drawing IV Laboratory (2) Christian Doctrine III (3) (4)	Christian Doctrine I (1) (2) Physics II Laboratory (3) Physics VI Laboratory (3) Botany I Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) M. E. III Design (3) E. E. I Laboratory (3)	Drawing I Laboratory (1) Biology I Laboratory (2) Drawing IV Laboratory (2) Mech. III Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	
3	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Botany I Laboratory (3) Physics II Laboratory (3) E. E. I Laboratory (3) M. E. III Design (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) French I (1) Physics I Laboratory (Section A) (2) Biology I Laboratory (2) Drawing IV Laboratory (2) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	French I (1) Math. IV Problem Work (2) Physics II Laboratory (3) Physics VI Laboratory (3) Botany I Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) M. E. III Design (3) E. E. I Laboratory (3)	French I (1) Drawing I Laboratory (1) Biology I Laboratory (2) Drawing IV Laboratory (2) Mech. III Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	
4	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) M. E. III Design (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) Physics I Laboratory (Section A) (2) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	Physics II Laboratory (3) Physics VI Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) M. E. III Design (3)	Drawing I Laboratory (1) Mech. I Problem Work (2) M. E. VI Laboratory (4)	
5	C. E. I Field Work (2) C. E. VIII Structural Design) (4)	Arch. II (Freehand Drawing) (2) (3) (4)	Chem. VIII Laboratory (4)	C. E. IV Field Work (3)		
8	Arch. I (Architectural Drawing) (3)		Arch. IV (Design) (2) (3)	Arch. VI (Construction) (3)	Arch. V (Architectural History) (3)	

This schedule is nearly complete for lecture and laboratory hours in all subjects prescribed for the baccalaureate degrees offered in the School of Sciences.

The numbers in parentheses indicate the year of the four-year degree course in which the corresponding subjects are ordinarily to be taken.

SCHEDULE OF HOURS

SECOND HALF-YEAR

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A. M. 8			Math. IV Problem Work (2)	Economics I (4)	Economics I (4)	Economics I (4)
9	Math. III (Section A) (1) Chem. II (Organic Chemistry) (2) C. E. I (Surveying) (2) M. E. I (Shopwork) (2) Philosophy II (Logic) (3) E. E. X (D. and A. C. Machinery) (4)	M. E. II (Mechanism) (2) Philosophy II (Logic) (3) C. E. XI (Sanitary and Hydraulic Eng'g) (4) C. E. XII (R. R. Eng'g) (4) E. E. III (A. C. Machinery) (4)	Math. III (Section A) (1) Mech. I (Theoretical Mechanics) (2) Philosophy II (Logic) (3) C. E. VII (Theory of Structures) (4) E. E. IV (A. C. Machine Design) (4)	Math. III (Section A) (1) M. E. II (Mechanism) (2) Mech. III (Applied Mechanics) (3) C. E. XII (R. R. Eng'g) (4) E. E. III (A. C. Machinery) (4)	Math. III (Section A) (1) Chem. II (Organic Chemistry) (2) C. E. I (Surveying) (2) M. E. I (Shopwork) (2) Mech. III (Applied Mechanics) (3) C. E. VII (Theory of Structures) (4)	Math. III (Section A) (1) Physics I Laboratory (Section C) (2) E. E. III (A. C. Machinery) (4)
10	Chem. I (1) Biology I (2) Astronomy II (3) E. E. II (A. C. Circuits) (3) C. E. VII (Theory of Structures) (4) M. E. IX (M. E. Seminar) (4)	English I (1) Math. IV (Calculus) (2) C. E. VI (Theory of Structures) (3)	Chem. I (1) Biology I (2) Astronomy II (3) E. E. II (A. C. Circuits) (3) Drawing VI (Perspective and Stereotomy) (3) C. E. XII Laboratory (4) Chem. VIII Laboratory (4)	English I (1) Math. IV (Calculus) (2) C. E. VI Theory of Structures) (3) C. E. IX (Foundations) (4) M. E. VIII (E. and P. P. Design) (4)	Chem. I (1) English V (2) C. E. IV (R. R. Surveying) (3) E. E. II (A. C. Circuits) (3) Drawing VI (Perspective and Stereotomy) (3)	Math. III (Section B) (1) Math. IV (Calculus) (2) Physics I Laboratory (Section C) (2) C. E. VI (Theory of Structures) (3)
11	Drawing I (Mechanical Drawing) (1) Physics I (2) C. E. V (Materials of Construction) (3) C. E. VIII (Structural Design) (4) E. E. III (Laboratory) (4) M. E. IX (M. E. Seminar) (4)	German I (1) English VI (2) Physics II (3) Mech. III (Applied Mechanics) (3) C. E. VII (Theory of Structures) (4) M. E. VII (Thermodynamics) (4)	German I (1) Physics I (2) Botany I (3) C. E. XII Laboratory (4) E. E. III Laboratory (4) Chem. VIII Laboratory (4)	German I (1) English IV (2) Physics VI (Magnetism and Electricity) (3) C. E. II (Advanced Surveying) (3) E. E. X Laboratory (4)	Physics I (2) C. E. V (Materials of Construction) (3) C. E. XII Laboratory (4) E. E. III Laboratory (4) M. E. VII (Thermodynamics) (4)	Physics I Laboratory (Section C) (2) Astronomy II (3) E. E. II Laboratory (3) M. E. VII (Thermodynamics) (4)
12	Math. III (Section B) (1) Math. IV Problem Work (2) C. E. VIII (Structural Design) (4) E. E. III Laboratory (4)	Math. III (Section B) (1) Mech. I (Theoretical Mechanics) (2) E. E. X Laboratory (4) M. E. VIII (E. and P. P. Design) (4)	English II (1) C. E. IV (R. R. Surveying) (3) Chem. VIII (Metallurgy) (4) E. E. III Laboratory (4)	Math. III (Section B) (1) Mech. I (Theoretical Mechanics) (2) C. E. II (Advanced Surveying) (3) E. E. X Laboratory (4)	Math. III (Section B) (1) Biology I (2) M. E. II (Mechanism) (2) C. E. XI (Sanitary and Hydraulic Eng'g) (4) C. E. XII Laboratory (4) E. E. III Laboratory (4)	Physics I Laboratory (2) E. E. II Laboratory (3)
P. M. 2	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) Botany I Laboratory (3) E. E. II Laboratory (3) M. E. III (Machine Design) (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) Physics I Laboratory (Section A) (2) Christian Doctrine III (3) (4)	Christian Doctrine I (1) (2) Physics II Laboratory (3) Physics VI Laboratory (3) Botany I Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) E. E. II Laboratory (3) M. E. III Design (3)	Drawing I Laboratory (1) Biology I Laboratory (2) Mech. III Laboratory (3) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	
3	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) Botany I Laboratory (3) E. E. II Laboratory (3) M. E. III Design (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) French I (1) Physics I Laboratory (Section A) (2) Biology I Laboratory (2) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (1)	French I (1) Physics II Laboratory (3) Physics VI Laboratory (3) Botany I Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) E. E. II Laboratory (3) M. E. III Design (3)	French I (1) Drawing I Laboratory (1) Biology I Laboratory (2) Mech. III Laboratory (3) M. E. V Laboratory (3) C. E. XI Laboratory (1) M. E. VI Laboratory (4)	
4	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) M. E. III Design (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) Physics I Laboratory (Section A) (2) Biology I Laboratory (2) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	Physics II Laboratory (3) Physics VI Laboratory (3)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) M. E. III Design (3)	Drawing I Laboratory (1) Mech. I Problem Work (2) M. E. V Laboratory (3) M. E. VI Laboratory (4)	
5	C. E. I Field Work (2) C. E. VIII (Structural Design) (4)	Arch. II (Free-hand Drawing) (2) (3) (4)		C. E. IV Field Work (3)		
8	Arch. I (Architectural Drawing) (3)		Arch. IV (Design) (2)	Arch. VI (Construction) (3)	Arch. V (Architectural History) (2) (3)	

	chine Design) (3) C. E. VIII (Structural Design) (4)					
3	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) Botany I Laboratory (3) E. E. II Laboratory (3) M. E. III Design (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) French I (1) Physics I Laboratory (Section A) (2) Biology I Laboratory (2) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	French I (1) Physics II Laboratory (3) Physics VI Laboratory (3) Botany I Laboratory (3) Chem. VIII Laboratory (4)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) E. E. II Laboratory (3) M. E. III Design (3)	French I (1) Drawing I Laboratory (1) Biology I Laboratory (2) Mech. III Laboratory (3) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	
4	Chem. I Laboratory (1) Chem. II Laboratory (2) C. E. I Field Work (2) Physics II Laboratory (3) M. E. III Design (3) C. E. VIII (Structural Design) (4)	Drawing I Laboratory (1) Physics I Laboratory (Section A) (2) Biology I Laboratory (2) M. E. V Laboratory (3) C. E. XI Laboratory (4) M. E. VI Laboratory (4)	Physics II Laboratory (3) Physics VI Laboratory (3)	Chem. I Laboratory (1) Chem. II Laboratory (2) Physics I Laboratory (Section B) (2) C. E. IV Field Work (3) M. E. III Design (3)	Drawing I Laboratory (1) Mech. I Problem Work (2) M. E. V Laboratory (3) M. E. VI Laboratory (4)	
5	C. E. I Field Work (2) C. E. VIII (Structural Design) (4)	Arch. II (Freehand Drawing) (2) (3) (4)		C. E. IV Field Work (3)		
8	Arch. I (Architectural Drawing) (3)		Arch. IV (Design) (2)	Arch. VI (Construction) (3)	Arch. V (Architectural History) (2) (3)	

SESSIONS

The academic year begins Tuesday, October 3, 1911, and ends on Graduation Day, Wednesday, June 5, 1912. It is divided into Fall, Winter, and Spring Terms by short recesses, at Christmas and Easter. The semi-annual examination period divides the year into First Half-Year and Second Half-Year.

The Christmas recess begins Friday, December 22, 1911, and ends Tuesday, January 2, 1912.

The Easter recess begins Wednesday, April 3, 1912, and ends Wednesday, April 10, 1912.

The semi-annual examination period in 1912 begins Monday, January 29, and ends Saturday, February 3.

The annual examination period in 1912, begins Monday, May 20, and ends Saturday, June 1.

Holidays and other stated days are mentioned in the University Calendar contained in the Year-Book.

For further information concerning the work of this School, apply to the Dean of the Faculty of Sciences.

For copies of the Year-Book, or for copies of the Announcements of the other Schools of the University, address the Registrar.

REGISTER OF STUDENTS OF SCIENCES
1910-11

CANDIDATES FOR ADVANCED DEGREES

The Department in which occurs the principal subject of the student, as a candidate for the degree Engineer, Master or Doctor, is indicated by *italics;* work in other Departments is indicated by Roman type.

NAME	YEAR OF ENTRANCE	HOME RESIDENCE
Bast, Rev. Victor August, A. B. (St. Mary's Seminary, Baltimore, Md.) 1904; S. T. B. (*ibid.*) 1908. Departments: *Chemistry;* Mathematics.	1908.	*Washington, D. C.*
Cannon, Rev. Dominic Joseph, C.S.C., A. B. (University of Notre Dame) 1907. Departments: Chemistry; Physics; Sacramental Theology.	1907.	*Washington, D. C.*
Crook, Louis Henry, B. S. (The Catholic University of America, Washington, D. C.) 1909. Department: *Physics.*	1906.	*Brookland, D. C.*
Froning, Henry Bernhard, A. B. (St. Joseph's College, Collegeville, Ind.) 1908. Departments: *Chemistry;* Biology; Electrical Engineering; Philosophy.	1909.	*Celina, Ohio.*
Harbin, George Francis, A. B. (Georgetown University, Washington, D. C.) 1902; E. E. (The Catholic University of America) 1905; Diploma (From the Westinghouse Electric and Mfg. Company's School of Engineering), 1908. Departments: *Electrical Engineering;* Physics.	1908.	*Washington, D. C.*
Tuscher, Rev. Rudolph Matthias, Ph. B. (St. John's Seminary, Brighton, Mass.) 1906. Departments: *Physics;* Mathematics; Chemistry; Mechanics.	1909.	*Washington, D. C.*
Wagner, Rev. Ignatius Albert, C.PP.S., A. B. (St. Joseph's College, Collegeville, Ind.) 1904. Departments: *Chemistry;* Mathematics; Biology.	1908.	*Carthagena. Ohio.*
Zmich, Rev. Stephen, M.D.A., S. T. B. (The Catholic University of America) 1910. Departments: Mathematics; Chemistry, Physics.	1909.	*Brookland, D. C.*

CANDIDATES FOR BACCALAUREATE DEGREES

The course leading to a baccalaureate degree followed by the student is indicated in *italics* after his name. *A* indicates the bachelor of arts course; *S* the bachelor of science course; *Ch.* the bachelor of science in chemical engineering course; *Arch.* the bachelor of science in architecture course; *C* the bachelor of science in civil engineering course; *E* the bachelor of science in electrical engineering course; *M* the bachelor of science in mechanical engineering course.

FOURTH YEAR

Boillin, James Joseph, *S* 1908. *Clarksville, Tenn.*
Departments: Chemistry; Mechanics; Astronomy; Economics; History; Sociology; Christian Doctrine.
Cantwell, John James, *C* 1908. *Washington, D. C.*
Departments: Mechanics; Astronomy; Architecture; Civil Engineering; Electrical Engineering; Mechanical Engineering.
Carter, Thomas Hackman, *E* 1907. *Washington, D. C.*
Departments: Mechanics; Electrical Engineering; Mechanical Engineering; Economics.
Daly, John Joseph, *A* 1907. *Phoebus, Va.*
Departments: Electrical Engineering; Philosophy; Economics; Christian Doctrine; German.
De Vries, Joseph Roland, *E* 1907 *Arlington, Md.*
Departments: Mathematics; Mechanics; Electrical Engineering; Mechanical Engineering; Philosophy; Economics.
Edwards, John, Jr., *S* 1908. *Washington, D. C.*
Departments: Mathematics; Mechanics; Astronomy; Architecture; Civil Engineering; Mechanical Engineering.
McCarthy, Charles Stephen, *E* 1907. *Brookland, D. C.*
Departments: Mechanics; Electrical Engineering; Mechanical Engineering; Christian Doctrine.
McGeady, Peter Leo, *C* 1908. *Wanamie, Pa.*
Departments: Mathematics; Mechanics; Astronomy; Architecture; Civil Engineering; Mechanical Engineering.

THIRD YEAR

Butt, Frank Henry, *E* 1907. *Washington, D. C.*
Departments: Mathematics; Mechanics; Electrical Engineering; Mechanical Engineering; Philosophy.
Crowe, Joseph Nicholas, *A* 1907. *Washington, D. C.*
Departments: Mathematics; Chemistry; Electrical Engineering; Architecture; Philosophy; Christian Doctrine; English; German.
Finn, John Leo, *C* 1908. *Pittsburg, Pa.*
Departments: Mathematics; Mechanics; Astronomy; Mechanical Engineering; Civil Engineering; Philosophy.
Hatcher, William Edward, *A* 1907. *Brookland, D. C.*
Departments: Chemistry; Biology; Philosophy; Sociology; Christian Doctrine.
Widmayer, John Joseph, Jr., *C* 1909. *Washington, D. C.*
B. S. (St. John's College, Washington, D. C.) 1909.
Departments: Mathematics; Mechanics; Astronomy; Civil Engineering; Mechanical Engineering; Philosophy; Christian Doctrine; English; French.

SECOND YEAR

Baltzley, Clarence Edward, *Ch.* 1909. *Tallapoosa, Ga.*
Departments: Mathematics; Chemistry; Physics; Drawing; English; German.

Baumer, Joseph Lichtlin, *Arch.* 1909. *Brookland, D. C.*
Departments: Mathematics; Architecture; Drawing; Economics; Christian Doctrine; English; German.

Chapman, Thomas Hutchinson, *Ch.* 1909. *Washington, D. C.*
Departments: Mathematics; Chemistry; Mechanics; Drawing; Philosophy; English; French.

Greer, John James, *Ch.* 1908. *Washington, D. C.*
Departments: Chemistry; Biology; Drawing; Philosophy; Economics; English; German.

Maloney, Charles Patrick, *C* 1909. *Washington, D. C.*
Departments: Mathematics: Mechanics; Drawing; Astronomy; Civil Engineering; Mechanical Engineering; Philosophy; English.

Moore, George Edward. *E* 1910. *Hagerstown, Md.*
A. B. (Rock Hill College, Ellicott City, Md.) 1910.
Departments: Mathematics; Physics; Mechanics; Drawing; Civil Engineering; Mechanical Engineering; English.

O'Neill, Thomas Grover, *A* 1909. *Washington, D. C.*
Departments: Physics; Drawing; Philosophy; History; Latin; English; French.

Quinn, William Joseph, *C* 1910. *Washington, D. C.*
B. S. (St. John's College, Washington, D. C.) 1910.
Departments: Mathematics; Physics; Mechanics; Drawing; Civil Engineering; Philosophy; English.

Robinson, Charles Jabel, *Arch.* 1909. *Washington, D. C.*
Departments: Mathematics; Architecture; Civil Engineering; Philosophy; Christian Doctrine; English; French.

Robinson, Joseph Flading, *C* 1909. *Washington, D. C.*
Departments: Mathematics; Mechanics; Astronomy; Drawing; Civil Engineering; Mechanical Engineering; Philosophy; English; German.

Valade, Ernest Augustus, *E* 1909. *Plattsburg, N. Y.*
Departments: Mathematics; Physics; Mechanics; Astronomy; Drawing; Mechanical Engineering; Philosophy; English.

Whitney, Frederic Carter, *Ch.* 1909. *Washington, D. C.*
Departments: Mathematics; Chemistry; Astronomy; Drawing; Christian Doctrine; English; French; History.

FIRST YEAR

Beall, Everett Stanton, Jr., *M* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry, Physics; Drawing; English; German.
Bond, Llewellyn, *Ch.* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; English; French; German.
Brooks, Henry Queen, *C* 1909. *Washington, D. C.*
Departments: Mathematics; Chemistry; English; French.
Cockrell, Herbert Courtland, *M* 1909. *Washington, D. C.*
Departments: Mathematics; Physics; Mechanics; Philosophy; English.
Collins, Albert Bernard, *E* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Physics; Drawing; English; German.
Corridon, Joseph Bernard, *S* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Physics; English; French.
Crosson, George Leon, *S* 1910. *Asbury Park, N. J.*
Departments: Mathematics; Chemistry; Physics; Drawing; English; German.
Currin, John Alexander, *S* 1910. *Baltimore, Md.*
Departments: Mathematics; Chemistry; Drawing; English; German.
Delaney, John Cyril, *M* 1910. *Altoona, Pa.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Dwyer, Eugene Michael, *C* 1911. *Troy, N. Y.*
Departments: Mathematics; Mechanics; Civil Engineering; Mechanical Engineering; English.
Emerson, Joseph George, *C* 1908. *El Paso, Texas.*
Departments: Mathematics; Physics; Drawing; Civil Engineering; Am. History; Christian Doctrine.
Fegan, Hugh Bernard, *E* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Furey, William Henry, *S* 1910. *Ansonia, Conn.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Gutierrez, Ernesto Roman, *E* 1910. *Mexico City, Mexico.*
Departments: Mathematics; Chemistry; Physics; English; German.
Huerta, Carlos, *Arch.* 1910. *Mexico City, Mexico.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Lambert, John Raymond, *M* 1910. *Trenton, N. J.*
Departments: Mathematics; Chemistry; Physics; English; German.
Lannon, Thomas Ryder, *E* 1910. *Pensacola, Fla.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Luckett, Raymond Calderon, *E* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Drawing.
Maillard, Albert Ludovic, *E* 1910. *Trinidad, B. W. I.*
Departments: Mathematics; Chemistry; Drawing; English; French.

Marsden, Thomas James, *E* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Physics; Drawing; English.
McCarron, John Elmore, *C* 1910. *Washington, D. C.*
Departments: Mathematics; Drawing; Civil Engineering; English; French.
Murphy, Edward Aloysius, *S* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Physics; Drawing; English; German.
O'Donnell, Jeremiah Francis, *E* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Drawing; English; German.
O'Neill, Robert Leonard, *Arch.* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Rauber, Benjamin Thomas, *Ch.* 1910. *Wellsville, N. Y.*
Departments: Mathematics; Chemistry; Physics; Drawing; English; French.
Rivero, Horace Martin, *C* 1908. *Washington, D. C.*
Departments: Mathematics; Drawing; Civil Engineering; English; German; Philosophy; History; Christian Doctrine.
Robinson, Richard William, *A* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; English; Latin; German.
Rogers, Paul James, *M* 1910. *Mt. Vernon, Ohio.*
Departments: Mathematics; Chemistry; Drawing; English; German.
Slattery, John Joseph, *A* 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Drawing; English; Latin; German.
Waldeck, Henry John, *C* 1910. *Warren, Ohio.*
Departments: Mathematics; Chemistry; Drawing; English; French.
Woodward, Horace McParlin, Jr., *C* 1910. *Brookland, D. C.*
Departments: Mathematics; Chemistry; Drawing; English.
Zachary, Robert Yancey, Jr., *M* 1910. *Baltimore, Md.*
Departments: Mathematics; Chemistry; Physics; English; German.

SPECIAL STUDENTS

Bresnahan, Thomas James, 1909. *Washington, D. C.*
Departments: Mathematics; French.
Caldwell, Frederick Warden, 1910. *Washington, D. C.*
Departments: Mathematics; Drawing.
Carroll, Joseph Jeremiah, 1910. *Alexandria, Va.*
Departments: Chemistry; Physics; French.
Clancy, John Terence, 1909. *New York, N. Y.*
Departments: Chemistry; Physics; English.
Collins, Robert William, 1910. *Washington, D. C.*
Departments: Mathematics; Drawing.

Dannaher, Edward James, 1910. *Nashville, Tenn.*
Departments: Mathematics; Chemistry; Drawing; English; French; German.

Ellis, Walter Wilfred, 1909. *Washington, D. C.*
Department: Mathematics.

Fitzgerald, James Blaine, 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Drawing; English; French.

Fuerst, George Martin, 1910. *Brookland, D. C.*
Department: Architecture.

Gallagher, Patrick Joseph, 1909. *Washington, D. C.*
Departments: Mathematics; Drawing; English.

Gennavario, Pasque, 1910. *Clifton, N. J.*
Departments: Mathematics; Drawing; English; History; Politics.

Girardi, Nicolas, 1909. *Washington, D. C.*
Departments: Mathematics; Drawing.

Glancy, Francis Patrick, 1910. *Washington, D. C.*
Department: Architecture.

Hunter, William Edward, 1910. *Bladensburg, Md.*
Departments: Chemistry; English; German.

Hurley, Walter Vincent, 1910. *Hyattsville, Md.*
Departments: Mathematics; Drawing.

Lybrand, Harry Clay, 1910. *Washington, D. C.*
Department: Chemistry.

Monaco, Pasquale, 1909. *Washington, D. C.*
Departments: Mathematics; French.

Nachman, Harold Johannes, 1910. *Washington, D. C.*
Departments: Mathematics; Drawing.

Ortman, Louis Francis, 1910. *Washington, D. C.*
Departments: Mathematics; Drawing.

Rauth, John William, 1909. *Hagerstown, Md.*
Department: Drawing.

Solbach, Clemens Joseph, 1910. *Washington, D. C.*
Departments: Mathematics; Drawing.

Szabo, Rev. Joseph Nicholas, 1911. *Lorain, Ohio.*
Departments: Mathematics; Chemistry; Physics; Mechanics.

Timothy, James Simmons, 1911. *Nashville, Tenn.*
Departments: Mathematics; Chemistry; Civil Engineering.

Tobin, Martin Arthur, 1910. *Fort Henry, N. Y.*
Departments: Electrical Engineering; History.

Torney, George Edward, 1910. *Washington, D. C.*
Departments: Mathematics; Drawing.

de la Torre y Cañas, Adolpho Martinez, 1909. *Mexico City, Mexico.*
Departments: Physics; Electrical Engineering.

Yerby, Everett Dudley, Jr., 1910. *Washington, D. C.*
Departments: Mathematics; Chemistry; Physics; French.

STUDENTS FROM OTHER FACULTIES

Andrew, Herbert Blase, Department: Physics.	1910.	*Washington, D. C.*
Dempsey, James Bergen, Department: Physics.	1909.	*Albany, N. Y.*
Dietz, Frederick Conrad, Department: Chemistry.	1910.	*Oberlin, Ohio.*
Kirby, Patrick Francis, Department: Mathematics.	1910.	*Sioux Falls, S. D.*
Kummer, Bernard Aloysius, Department: Physics.	1910.	*Washington, D. C.*
McDonnell, Charles Patrick, Department: Physics.	1909.	*Florence, Mass.*
Oakley, John Bernard, Departments: Mathematics; Chemistry.	1910.	*Newport News, Va.*
Robinson, Thomas Raymond, Departments: Mathematics; Physics.	1907.	*Washington, D. C.*
Scully, Peter Anthony, Department: Mathematics.	1910.	*Albany, N. Y.*
Tansill, Charles Christopher, Department: Chemistry.	1908.	*Brookland, D. C.*
Woods, James Enright, Department: Physics.	1909.	*New London, Conn.*

SUMMARY

Candidates for advanced degrees		8	
Candidates for Baccalaureate Degree:	Fourth Year	8	
	Third Year	5	
	Second Year	12	
	First Year	32	
Special students		27	
Total science students			92
Students from other faculties			11
Total students taking science studies			103

The Catholic University of America

OUR CHIEF CATHOLIC EDUCATIONAL CENTER

The Catholic University Press
Washington, D. C.

THE CATHOLIC UNIVERSITY OF AMERICA, WASHINGTON, D. C.

OFFICERS OF ADMINISTRATION

Chancellor, His Eminence Cardinal Gibbons.
Rector, Rt. Rev. Thomas J. Shahan, D.D.
Vice-Rector, Very Rev. George A. Dougherty, D.D.
Registrar, Charles Fox Borden, A.M.

This Pontifical University, the only institution of its kind in the United States, was founded in 1889 by Pope Leo XIII and the Catholic Hierarchy of the United States, as a great central seat of learning, under the control of the Bishops of the United States. It is immediately governed by a Board of Trustees, made up of bishops, priests and laymen, who represent the American Catholic Church in its ownership and direction of the University, which is also organized under the laws of the District of Columbia.

LOCATION

Washington, being the Capital of the Nation, is an ideal site for a great University. No city in the United States is more easily reached. The climate is healthful. The libraries, laboratories, museums, and general equipment of the great governmental departments offer unparalleled advantages, all of which are by law at the disposal of students properly qualified and recommended. The political life of the world's greatest republic is best observed and studied at the very heart of the republic, while the Catholic religious life of the city is quite rich, varied and attractive.

The University is situated at the intersection of Michigan Avenue and Fourth Street Northeast. The Brookland cars of the City and Suburban Line, Washington Railway and Electric Company, pass the chief entrances to the grounds. The local trains of the Baltimore and Ohio Railroad, Metropolitan Branch, stop at University.

SCHOOLS AND DEPARTMENTS

The University is divided into five schools—Theology, Philosophy, Letters, Law and Science—subdivided into departments, each of which is directed by a head professor, under whom are associate professors and instructors. The teaching staff is made up of over fifty highly trained specialists, each of them eminent in his particular branch, while several enjoy a world-wide fame.

ADMISSION AND RESIDENCE

The undergraduate or collegiate courses of the University are open to young men who have attained the age of eighteen, and have graduated from an approved high school or have received an equivalent training.

The University does not conduct a preparatory school, and desires only mature and earnest young men capable of profiting by exceptional advantages.

All applications for admission must be addressed to the Rector, and must be in writing and state the following particulars: (1) The full name, residence, and age of the applicant; (2) the department or departments of the University which he desires to enter; (3) the character, extent and place of his past education; (4) degrees already received. The application must be accompanied by a certificate of his good moral character, preferably from his parish priest, and by a testimonial showing that he is a high-school graduate or is otherwise duly equipped.

Unless excused for good reason by the Rector, all students must reside in one of the buildings provided for them. They are strictly subject to the rules of the University regarding morals, studies and general conduct; the President of each residential college is immediately responsible for those under his charge. Special students or auditors may be admitted by arrangement with the Rector.

FEES AND EXPENSES

Lay students can obtain their living in the University dormitories for about thirty dollars per month. The better rooms are more costly, according to location and comforts. The regular tuition fee for all students is one hundred dollars, from which students in the School of Sacred Sciences (Theology) are exempt. Board and lodging may be had by theological students in Divinity Hall for two hundred and fifty dollars per year. Moderate laboratory expenses are in addition to the tuition fee - e. g., twenty dollars each for Chemistry and Physics, ten dollars each for Biology, Botany, Mechanical Engineering and Electrical Engineering. A lay student can live and study comfortably at the University for less than four hundred dollars a year. The fee for single or special courses is twenty dollars for each course.

TERMS AND VACATIONS

The academic year begins on the first Tuesday of October and ends on the Wednesday nearest to the seventh day of the following June. Short recesses are given at Christmas and Easter.

THE STUDENT BODY

The University is open to male students, both Catholic and non-Catholic, and offers degree courses in all sciences except medicine. Several of its courses, however, offer the substance of a pre-medical training, and prepare a young man to pursue successfully the work of the professional school.

The undergraduate student will find at the University all reasonable attractions, an excellent athletic field, golf links, baseball, football, tennis, basket ball, and other amusements; also a debating society, a college paper, music, oratorical contests, and the opportunity to hear in the public lecture courses eminent speakers of national reputation.

MORAL AND RELIGIOUS INSTRUCTION

To develop in the students correct methods of investigation and reasoning all lay students are required to pursue a course of at least one year in the Department of Scholastic and Modern Philosophy—covering the subjects of the Field, Methods and Systems of Philosophy; Principles of Ethics; Logic, and General Psychology. All undergraduate lay students are further required to follow the courses in Religious Instruction, which are intended to afford them an intelligent grasp of the truths of their religion, and enable them at once to recognize the demands of Faith and Science, and to translate both into personal conduct. Daily contact, moreover, with numerous mature ecclesiastics, in the class room and on the campus, makes for an active religious temper in the lay students, while on all sides the evidences of Catholic life and faith tend to fill them with pride in their religion, and to create in their hearts a life-long respect and love for it. Catholic worship is conducted with dignity, and the numerous public ceremonies affect the student body in a pleasing and impressive way.

AFFILIATED COLLEGES

In pursuance of the General Constitutions of the University and the instructions of the Holy See given in the Apostolic Letter of March 7, 1889, the Board of Trustees have made the following regulations: "Any Catholic institution of learning, whose courses of instruction qualify its students for admission to any Department of the University, may at its own request and without prejudice to its autonomy be enrolled, by order of the Board of Trustees, among the affiliated institutions of the University; and being so enrolled, its graduates shall be admitted to those departments of the University without examination, upon presentation of the certificates or diplomas which attest their completion of its courses of study."

THEOLOGY

The University, though authorized by Leo XIII to admit to the study of the Sacred Sciences beginners in philosophy and theology, has hitherto regularly accepted only such ecclesiastical students as have completed three years of theology and desire to acquire the degree of Licentiate given to successful candidates on the completion of their fifth year of theological studies. Students are permitted to stand for the Baccalaureate of Theology on entering the University. Advanced courses are given in Sacred Scripture, Dogmatic and Sacramental Theology, Moral Theology, Canon Law, Church History, Apologetics, and Ecclesiastical Music. With a view to broadening their general culture, theological students are encouraged to follow courses in the Schools of Philosophy, Letters, Law and Science. A splendid library of theology is at the disposal of students.

PHILOSOPHY

The importance of a solid training in the principles of Catholic Philosophy cannot be overestimated, and in this respect the University offers excellent advantages. The teaching is organized with a view to the needs both of graduate students and of those who are candidates for the Bachelor's degree. Whatever subject he may select as his specialty, the student must acquire correct methods of reasoning. He must learn to seek for underlying principles and apply these to the solution of particular problems. Much importance is therefore attached to the courses in Logic and Metaphysics. For securing breadth, culture and a deeper insight into the relations existing between the various questions discussed by Philosophy, an acquaintance with the History of Philosophy is indispensable. The course in this subject extends over two years. The work in Psychology includes a thorough discussion of experimental methods with research in a well-equipped laboratory. Instruction in ethics holds a prominent place; the elementary course treating of fundamental moral principles and the advanced course of selected problems that are of interest to the student of Law, Sociology and Economics no less than to the student of Philosophy. The Library of the School of Philosophy contains, besides the standard works, a large collection of dissertations and complete sets of the journals and reviews that place the periodical literature of Philosophy at the student's disposal.

HISTORY

Special stress is laid on historical study, not only in the introductions to all sciences taught at the University, but particularly in the departments of history, both ecclesiastical and civil. Elaborate courses are offered in Church history, early, mediæval and modern, in general mediæval and modern history, the history of philosophy, science, ancient and modern literatures, music and art, also archeology, Christian and classical. The Chair of American History, founded by the Knights of Columbus, provides for a complete study of American life in all its phases, above all for a fair presentation of the part Catholics have taken in the establishment and growth of our country. The chairs of literature are also to a great extent, feeders of the departments of history. The Gaelic Chair, established by the Ancient Order of Hiberians, encourages the study of all phases of Irish history, ancient, mediæval, and modern, while the German Chair, founded by the late Rev. Anthony H. Walburg, of Cincinnati, assures a full and sympathetic treatment of German literature and history and the correlated subjects of art, music, science, philosophy, etc. No doubt chairs of other national literatures will in due time be founded. Eventually the historical departments of the University will exercise a profound influence on American public opinion.

EDUCATION

The most urgent need in all our schools is that of well-trained teachers. Besides an acquaintance with the subjects included in the curriculum the teacher is expected to thoroughly understand educational methods. This means that he must have an intelligent grasp of the principles on which sound methods are based. And since both principles and methods are the outcome of a long development, they must be studied from the historical as well as from the scientific point of view. In order to assist teachers in securing the requisite preparation, the University offers courses in the Philosophy, Psychology and History of Education, in Special Methods, the Art of Study, and School Management. The work is organized with special reference to the needs of students who will eventually, as superintendents or in some other capacity, be charged with the duty of directing and improving our elementary schools. Catholic teachers in particular should be familiar with what the Church has accomplished in the field of education and with the ideals which she maintains in regard to the intellectual, moral and religious development of the child. They will, moreover, add to the efficiency of their work by noting the various movements and discussions that arise from day to day as the result of activity in other educational systems. To aid them in this respect, The Catholic Educational Review is published under the direction of this department in ten issues yearly. It deals with all the vital problems and surveys the field of education at large in the light of Catholic truth, thus bringing the work of the University to the service of all our teachers.

SOCIOLOGY

Wider study of contemporary social life is undertaken with a view to discover the structure of society generally, the relations and organization of the larger human interests—political, religious and industrial—which give rise to the fundamental social order. The student is directed to a study of typical social groups which enter into his personal history with a view to discover the natural meaning and relations of social groups generally. Sociological literature is read in the light of these results and the student is then encouraged to combine the results of his observation and reading into systematic form. The history of Sociology, the meaning, organization and principles of reform movements are studied. Particular attention is paid to problems of poverty and of relief and to the Catholic Social Reform movements in Europe.

POLITICAL ECONOMY

Political Economy is taught not merely because it possesses disciplinary and cultural value in a high degree but also because of its wide practical appeal. The importance of an acquaintance with the principles governing the production and distribution of wealth in adding to the efficiency of the charity worker, the lawyer, or the business man needs hardly to be pointed out.

The University offers courses in Elements of Political Economy, Value, Distribution of Wealth, Modern Industrialism, History of Economic Theory and of Economic Institutions, Money and Banking, Public Finance, Labor Problems and Utopias and Reform Movements. The library facilities are excellent, and the Library of Congress, near at hand, offers many advantages for advanced students.

LETTERS

Courses, graduate and undergraduate, are given in the following languages and literatures: Latin, Greek, English, French, German, Spanish, Hebrew, Coptic, Syriac, Arabic, Gaelic, Welsh and Breton. The undergraduate courses lead to the degrees of Bachelor of Arts and Bachelor of Letters, and aim at imparting the knowledge, culture, and training that a liberal education calls for. They also enable the student to begin the acquisition of the special knowledge presupposed for any serious study of Law, Medicine or Theology. The graduate courses lead to the degrees of Master of Arts, Master of Letters, Doctor of Philosophy and Doctor of Letters. They aim at training students in the methods of philological research, with a view to their later calling as teachers or experts in philology. This training is (a) scientific, for it is recognized that language possesses laws and conclusions that may be investigated inductively like those of any other science; (b) professional, for it is also true that the best teachers of language and literature are those who are properly equipped for philological research. Already many of our alumni are professors in various schools, colleges and universities. Besides the rich library of the University, the various departments of the School of Letters dispose of large special libraries that are always open to students.

LAW AND JURISPRUDENCE

The School of Law, as here constituted, occupies the place and offers the advantages not only of the ordinary American Law School, but also of the School of Jurisprudence of the great European Universities. It contains four departments—a Baccalaureate Department of Common Law, a Graduate Department of Common Law, a Department of Civil Law, and a Department of Jurisprudence.

The Baccalaureate Department of Common Law is the equivalent of the ordinary American Law School, and is devoted to the training of young men for admission to the American bar. Its courses of instruction cover a period of three years, the first two of which are passed at the University in the close and critical study of substantive law, or the law of private and public rights; the third year is spent in the study of adjective law, or the law of remedial rights (including practice and procedure), either at the University or at the option of the student, in some local office or law school in the State where he intends to practise. These courses lead to the degree of Bachelor of Laws (LL.B.).

The Graduate Department of Common Law offers to members of the bar and other mature students advanced courses of instruction in all the principal branches of the Common Law. The instruction in each of these branches is in charge of a professor who is a specialist of recognized authority in his particular branch of learning, and is intended to develop in the student efficient habits of research and expression as well as to make him master of the subject of his studies. These courses cover a period of one or more years, according to the nature of the selected subject and the progress of the student, and lead to the degrees of Master of Laws (LL.M.) and Doctor of Law (J.D.).

The Department of Civil Law is occupied with studies in the Roman Law and its relations to the Common Law and the Canon Law. Its courses of instruction embrace the entire field of the Civil Law, and are conducted by professors who received their education and obtained their Doctor's degrees in the Roman schools. They cover a period of five years and lead to the degrees of Bachelor, Master and Doctor of the Civil Law (B.C.L.), (M.C.L.), (D.C.L.).

The Department of Jurisprudence is devoted to the study of law as an ethical, philosophical and historical science and to the practical application of its fundamental principles in the great systems of government which have from time to time prevailed throughout the world. Its courses of instruction lead in two or more years to the degree of Jurisprudentiæ Doctor (D.Jur.); in two additional years to the degree of Juris Civilis Doctor (J.C.D.), or the degree of Juris Communis

Doctor (J.Com.D.); in two more years to the degree of Juris Utriusque Doctor (J.U.D.); in two final years to the degree of Doctor of Laws (LL.D.).

CHEMISTRY

Recognizing the great importance of chemistry as a factor in human progress, the University has provided an equipment for training young men in chemical science, which ranks among the most complete and effective in the country. The courses of instruction lead to an adequate preparation for the career of teacher, scientist, analyst, engineer and technical chemist. The laboratories are spacious and well lighted, and the student has at his disposal apparatus and working material that meet all the demands of his zeal and earnestness. In the Laboratory of General Chemistry the student is at once brought to see the practical bearing of the laws and theories of the science which he has acquired in his preparatory work. His working material consists of ores and mineral deposits, industrial wastes and scrap metals, which he works up into various compounds of economic value. He acquires a knowledge of the usual gravimetric, volumetric and electrolytic methods of analysis, together with a practical training in laboratory methods necessary for further progress in the science. Work in the Organic Laboratory begins with the purification of hydrocarbons and their derivatives, and the preparation and identification of typical substances. Then follow the more difficult operations of nitrification, sulphonation, reduction, oxidation, and the other laboratory processes which have been so effective in modern synthetic chemistry. The laboratory exercises also call for a certain amount of work in physical chemistry, such as the cryoscopic and other standard methods of determining molecular weights, osmotic pressure, the theory and use of the spectroscope, polariscope, etc. The Department of Chemistry possesses an excellent working library.

PHYSICS

Experimental and mathematical physics and theoretical and applied mechanics are under this department. The work in the advanced courses in Physics and Mechanics is directed especially toward (a) original investigation in physics; (b) the training of teachers of physics for colleges and universities. The more elementary courses are designed for the training of (a) the general student in scientific methods of work; (b) the prospective student of engineering, medicine, etc., for later professional studies; (c) teachers of physics for secondary schools. Instruction is given by lecture, problem and laboratory method.

The laboratories and lecture rooms of the Department of Physics are in McMahon Hall, pending the erection of a Physical Laboratory that shall be planned with special reference to the best facilities for both elementary and advanced work. The Department is supplied with the usual general equipment of apparatus and supplies for physics. Gas, water, compressed air, suction and electricity are available in every room. Apparatus for special investigations is purchased as needed. A well equipped shop furnishes opportunity for the construction of pieces of research apparatus. Apparatus for research is already considerable in quantity. The library of Physics has the more important sets of periodicals, as well as collections of treatises and texts pertaining to the work of the department.

Physics is required in all the courses of study leading to the degrees of Bachelor of Arts and Bachelor of Science. It is required as a minor in several of the courses for the degrees of Master and Doctor, and may be taken as a major for these degrees. Mechanics is required in all the courses leading to degrees in Engineering, and may be taken as a minor for some of the degrees of Master and Doctor.

MATHEMATICS

The study of mathematics is generally recognized as being of great value in any scheme of liberal education, for any line of scientific or technical work a mathematical training is a necessity. The Department of Mathematics of any university will therefore, at some pereiod of his couse, reach nearly every undergraduate student.

The requirements for admission, as a regular student, in any course leading to a degree, include Alegbra through quadratics, and Geometry, plane and solid. The elementary courses regularly offered in the department are accordingly Trigonometry and Algebra beyond quadratics. For some years past, however, instruction has been provided in the ordinary high school subjects —Elementary Algebra and Geometry—for those special students who are deficient in these subjects.

Candidates for the degree of Bachelor of Arts for whom, generally speaking, the value of the subject is largely cultural, are required to take one full year's work, comprising Trigonometry, Advanced Algebra, and Analytic Geometry. Beyond this point the work becomes more technical in character and less suited to the needs of the general student. For the engineering student, on the other hand, Calculus is indispensable as a foundation for his professional training, and a further course, lasting through the second year and the first half of the third, is accordingly required. In all the courses in mathematics special emphasis is laid on the solution of problems, on the principle that the student cannot thoroughly understand principles unless he is able to apply them readily to a wide variety of problems.

Advanced courses in such topics as Differential Equations, Theory of Functions, Vector Analysis and Projective Geometry are given when a sufficient number of students apply, such courses being important chiefly for the equipment of prospective teachers of these subjects.

CIVIL ENGINEERING

The course of studies, both preparatory and professional, covers four years, and aims at laying a substantial foundation to meet the demands of modern engineering practice.

The first year's work calls for the prescribed preliminary training common to the Bachelor of Science degree in all departments of the School of Science.

Second year work: Land and Topographical Surveying, covering the use and adjustment of surveying instruments, and computation and plotting from notes taken in the field. This is followed in the third year by Higher Surveying, such as triangulation, precise leveling and stadia and plane table work.

Highway Engineering: The location, construction and maintenance of roads, streets and pavements. Railroad Surveying: Problems and field practice in various curves, calculation of earth work quantities, location of a short line of railroad with preparation of profile and maps. Materials of Construction: Physical characteristics of the materials of construction used by the engineer. Theory of Structures: Elementary course in the loads, reactions and stresses acting upon simple structures. In the fourth year the latter course is continued. Analysis by graphical and analytical methods of stresses in structures, such as plate girders, roof and bridge trusses, trestle, retaining walls, etc. With this is given a course in Structural Design, covering the computation and design of typical structures. Foundation: A study of the foundations for various structures and methods of carrying on the work. Theoretical Hydraulics: The principles of hydro-static and hydro-dynamic pressure. An option is offered in Sanitary and Hydraulic Engineering (methods of construction, maintenance and design of sewage disposal, water supply, systems, purification and filtration, irrigation) or Railroad Engineering (maintenance of track and structures, economics of location, design of yards, station grounds, and other practical problems).

ELECTRICAL ENGINEERING

This Department equips the young man for efficient work along electrical lines. The course insists on thoroughness in fundamentals and logical methods of work, since it is realized that it is this groundwork obtained in school that forms the real basis on which the student will build his future success or failure.

The scope of the Department includes all the branches of electrical activity. In its work the aim is to strike the mean of the purely theoretical or ideal course and the one predominated by excessive laboratory and shop work. Here the laboratory courses are most thorough but are supplemental to the lecture work.

The Department occupies commodious quarters in the new Power Plant, second floor. The new lecture, design and office rooms, on the entire west side of the building, are well lighted and ventilated. Practically the entire remainder of this floor is given over to the Department's laboratory equipment.

This equipment is most general, taking in all commercial types of apparatus, one especial feature being that the size of the individual units is much larger than for the average laboratory apparatus. Up-to-date commercial practice is insisted on in the laboratory training.

Advantage is taken of the great variety of power plants located in and around Washington.

MECHANICAL ENGINEERING

In this science the University offers to young men an opportunity to qualify themselves for practical careers as mechanical engineers. The new Central Heating and Lighting Station, which also contains the Departments of Mechanical and Electrical Engineering, has greatly increased the efficiency of this Department.

The Mechanical and Steam Engineering laboratories are so arranged that they can be operated separately or as a unit, and may be run so as to include the main heating and lighting plant. There are two distinct laboratories, however, the mechanical and steam laboratory and the hydraulic laboratory. The flexibility of the two tends to promote a goodly number of experiments which are both interesting and instructive.

The laboratory equipment in this department is as follows: Three 200 H. P. Erie water tube boilers, equipped with Roney stokers, high and low water alarm and automatic feed pump and damper regulation; two 50 K. W. direct connected Skinner engines; one 20 K. W. Erie Ball Engine; one 20 H. P. Buckeye engine; one 10 H. P. vertical Troy engine; one 5 H. P. two-cylinder Westinghouse engine; one 10 H. P. Otto gas engine; one 2½ H. P. Webster gasoline engine; one 15 H. P. vertical fire tube boiler; one air compressor; two small and two large vacuum steam pumps; three small and one large steam pumps; steam injectors; calorimeters; square inch testers; vacuum testing apparatus; planimeters; steam indicators; stand pipe and tanks contining different shaped wiers; and other necessary apparatus.

ARCHITECTURE

The course in Architecture is arranged to meet the requirements of a broad general cultivation, liberal training in design and a thorough knowledge of the principles underlying sound construction.

Architecture demands a professional equipment that includes historic and scientific studies as well as artistic, and the curriculum recognizes the importance of studies directed toward breadth and thoroughness throughout the entire four years.

The professional work begins with freehand drawing from the cast, supplemented by courses in Water Color, Pen and Ink and Pencil Rendering and ultimately developes the skill in expression necessary to an intelligent presentation of the problems in design. Instruction in Modelling is given in connection with the Freehand drawing classes.

The Theory of Design and Architectural History are taken up simultaneously and a course in Shades and Shadows is given concurrently with the study of the Five Orders, which form the basis for the work in design and composition. Numerous special problems are given, simple in the beginning, based upon well established precedents, leading to problems of more intricate nature enabling the student to obtain a grasp of the elements of the various problems encountered in the practice of Architecture.

The History of European Civilization and Art is considered essential to grasp fully the spirit of Classical, Gothic and Rennaisance Art and the History of Ornament, and courses in these subjects are given as part of the necessary æsthetic training.

Scientific construction is given in such a manner as to enable the student to understand clearly the various methods of building and the use and preparation of Working Drawings and Specifications. Stereotomy and Perspective Drawing are supplementary to problems of an engineering nature, also practical instruction in Heating and Ventilation.

The School of Architecture possesses numerous exceptional advantages, the City of Washington offering to the student in the Fine Arts its many beautiful buildings, both public and private as sources of inspiration, examples of the most advanced ideas and refined taste in Monumental Architecture. In addition, the Congressional Library and the Corcoran Gallery of Art offer to the student treasures not to be surpassed.

LIBRARY AND MUSEUMS

The University Library is already one of the richest in our country. Its 70,000 volumes have been put together within less than three decades, and represent in large measure the best thought of recent times. It is systematically weeded of "deadwood" and kept up to date by the advice of our large corps of specialist professors. It is particularly rich in scientific periodicals, of which there are over five hundred in complete condition. The libraries of the professors aggregate some 50,000 volumes, and are always at the disposal of their students. In some respects the University has collected in three decades the most valuable collection of books in the United States.

UNIVERSITY PUBLICATIONS

The following publications of the University appear at regular intervals: The Catholic University Bulletin, eight issues yearly, subscription, $3; The Catholic Educational Review, ten issues yearly, subscription, $3; the University Symposium, a college magazine, eight issues yearly, subscription, $2.

In addition the University publishes an annual catalogue known as the Year Book.

For descriptive literature concerning the University, write to **THE REGISTRAR,** to whom all correspondence concerning admission of students should be addressed.

M'MAHON HALL

ALBERT HALL

Catholic University of America

Founded by Leo XIII and the American Hierarchy for the Development of Catholic Leaders in all departments of American life, religious, scientific, and patriotic.

LEO XIII: Since this great University not only tends to the greater honor of your country, but also promises rich and salutary results both for the spread of sound doctrine and the defence of the Catholic religion, we justly trust that the faithful of America, with their wonted greatness of soul, will not allow you to lack the help of their liberality for the splendid completion of the work now begun.

CARDINAL GIBBONS: In building up the University we are at the same time establishing a center of Catholic life from which new impulses and new forces will go out continuously to every part of the land and supply our manifold needs. No form of Catholic charity is more noble or more fruitful than that which is given to education in all its degrees, and nowhere can the generous giver better bestow his gifts than on an institution destined under Divine Providence to confer on all our people such lasting religious and educational benefits as the Catholic University.

ARCHBISHOP RYAN: It is a remarkable fact that the best permanent growth of the University has come with the contributions of the general Catholic public to its support. The individuals who by their donations made its beginning and early development possible, deserve great credit; but when the people in general, in obedience to the express wish of the Supreme Head of the Church, made it their very own by contributing to its support and sending their sons to its halls, it became the Catholic University in the truest sense of the word, and began that rapid healthy growth which predicts early maturity and long life.

ARCHBISHOP SPALDING: Let there be then an American Catholic University, where our young men, in the atmosphere of faith and piety, of high thinking and plain living, shall become more intimately conscious of the truth of their religion and of the genius of their country, where they shall learn the repose and dignity which belong to their ancient Catholic descent, and yet not lose the fire which glows in the blood of a new people.

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